TH
1
C254
v.5
no.8
c.1
ENGS

Index to Advertisers, 34
Editorial Index, 9

August, 1915

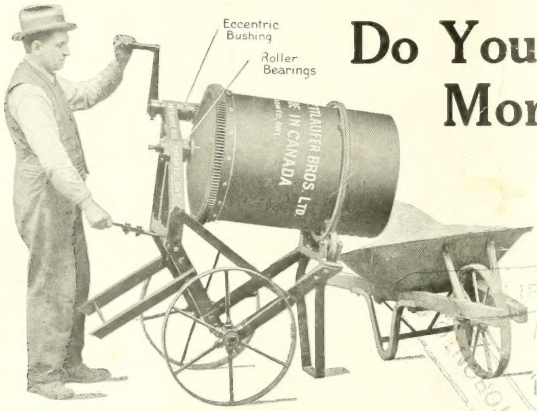
Price List - 30

The Canadian Builder and Carpenter

Published Monthly by The Commercial Press, Limited, 32 C Toronto

Who publish: The Canadian Manufacturer, The Canadian Clay-Worker, Motoring, Good Roads of Canada, Dealer and Contractor, Canadian Hardware Journal, Canadian Furniture World, The Retail Grocer and F... The Retail Druggist of Canada, and The Canadian Nurse.

C A Bradshaw
183 Dawnport Rd
TORONTO ONT.



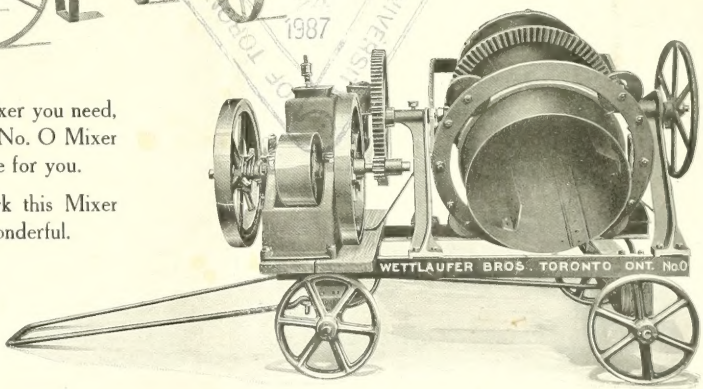
Do Your Concrete Work More Efficiently

and thus make more money by using one or other of these Wettlaufer Mixers.

Write for our Special Offer
Pays for itself in 7 days

If it's a Power Mixer you need, the Famous Little No. O Mixer is the very machine for you.

The range of work this Mixer will do is really wonderful.



Send for Circular giving complete information and prices.

WETTLAUFER BROS., LIMITED

Improved Concrete Machinery

HEAD OFFICE AND WAREROOMS: 178 SPADINA AVE., TORONTO, ONT.

U.S.A. 99 Oak St., Buffalo, N.Y.; 736-8 Fort St. W., Detroit, Mich.

Branches: MONTREAL, HALIFAX, WINNIPEG, REGINA, VANCOUVER, VICTORIA

Midland Planing Mill Products

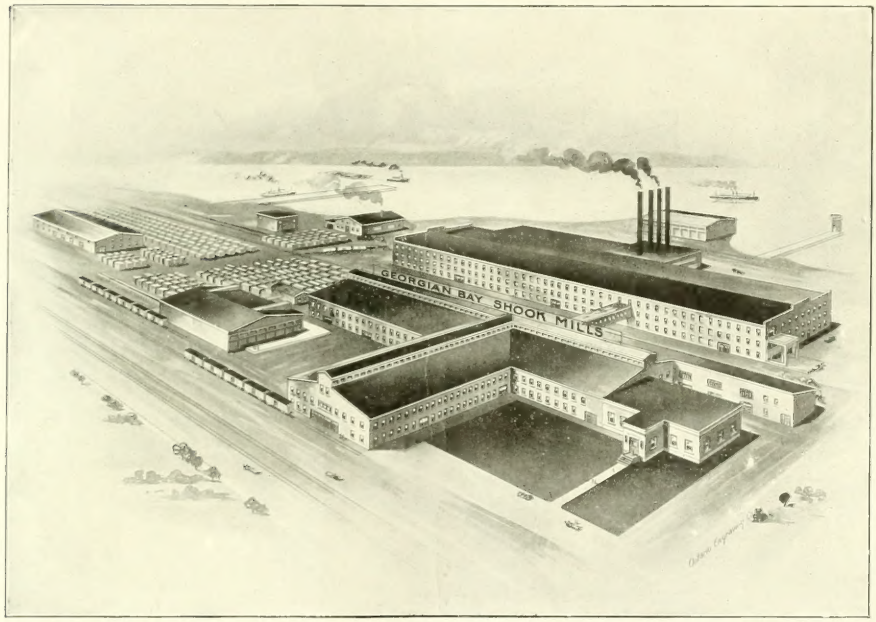
The Leading Stock Lines

TRY

Our Clear Red Pine Trim and Fir Doors as a Substitute for

YELLOW PINE TRIM AND DOORS

They Are Much Superior and Cheaper



Our representative is in your district now. Let us have him call without obligation to you. Or send us your lists, and let us quote you delivered prices.

Georgian Bay Shook Mills, Limited

MANUFACTURERS FROM THE TREE TO THE FINISHED PRODUCT

Midland, Ontario

Midland Planing Mill Products

The Leading Stock Lines

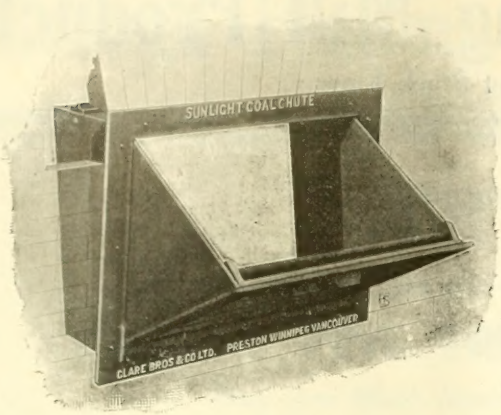
Our Leading Lines Are :—

Veneered Doors
Pine Doors
Sash
Hardwood Floo.ing
Pine and Hardwood Trim
Frames
Turned Columns
Stair and Other Turnings
Newels
Cupboards, Cabinets, Etc.
Stairs and Panelling
Dressed and Matched Lumber
Sized Hemlock and Sheeting
Shingles and Lath
Shooks

Georgian Bay Shook Mills, Limited

MANUFACTURERS FROM THE TREE TO THE FINISHED PRODUCT

Midland, Ontario



The Window Chute

is no longer a luxury but a recognized necessity in every up-to-date building.

Open—It's a chute through which fuel can be put into the basement with ease and convenience.

Closed—It's a window that locks automatically and can be opened only from the inside.

A Basement Window used for taking in fuel must be continually repainted, repaired and reglazed.

A Window Chute needs no repairs and is always neat and clean.

Prices sent on request.

Clare Bros. & Co., Limited :: PRESTON ONTARIO

Manufacturers of HECLA FURNACES, PENINSULAR RANGES

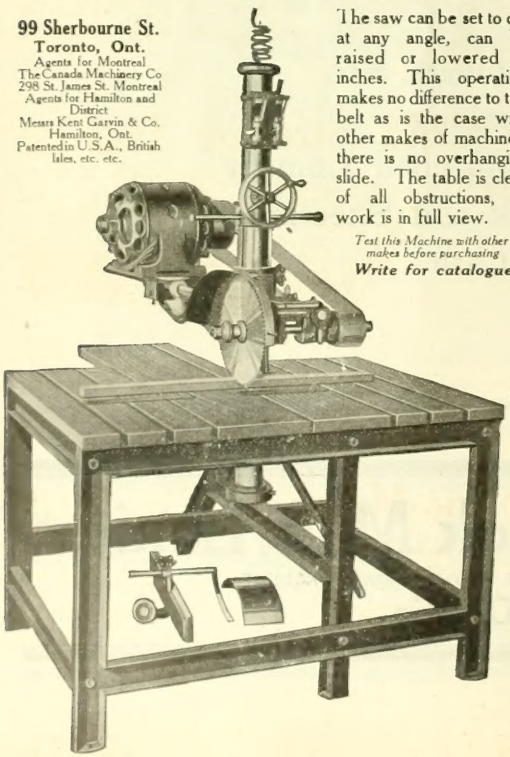
CLARE & BROCKEST, Limited, Winnipeg
REYNOLDS & JACKSON, Calgary
RACE, HUNT & GIDDY, Edmonton
J. M. KAINS & CO., Vancouver

The Hutchinson Combination Woodworker

99 Sherbourne St.
Toronto, Ont.
Agents for Montreal
The Canada Machinery Co
298 St. James St. Montreal
Agents for Hamilton and District
Messrs Kent Garvin & Co.
Hamilton, Ont.
Patented in U.S.A., British Isles, etc. etc.

The saw can be set to cut at any angle, can be raised or lowered 8 inches. This operation makes no difference to the belt as is the case with other makes of machines; there is no overhanging slide. The table is clear of all obstructions, all work is in full view.

Test this Machine with other makes before purchasing
Write for catalogue



You Can Build Beautiful Buildings

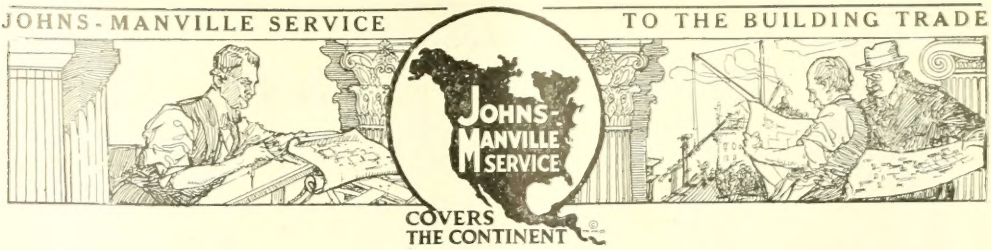
(as well as strong, fireproof) if you use granite faced cement blocks. These are made with rock and smooth finish in the following sizes:

8 x 8 x 16	4 x 8 x 8
8 x 8 x 8	12 x 8 x 16
12 x 8 x 8	

These blocks are mechanically mixed, are well cured and stand up well under severest conditions. Being waterproof the blocks maintain their beautiful appearance. We will gladly show you the blocks at our factory or send you full particulars on request.

Granite Concrete Block Co.

Cor. Yonge Street and St. Clair Ave.
TORONTO



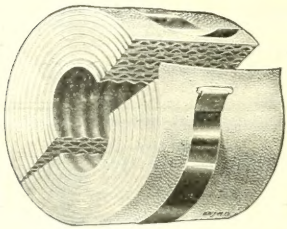
J-M Responsibility may be made a contributing partner in your business.

Whatever aids you to create confidence and assists you to retain it when secured puts capital into your business.

Every J-M Product specified by you—every J-M Product handled by you—has back of it the determination of H. W. Johns-Manville Company to win confidence and retain it by making that product give permanent satisfaction.

This is J-M Responsibility; and to make this responsibility actual between you and your customer "J-M Service covers the continent."

Pipe Covering *versus* J-M Insulation Service



One Style of J-M Heat Insulation.

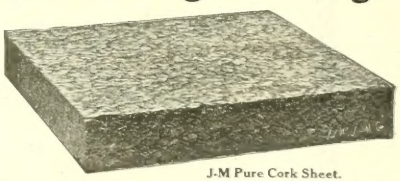
A client's opinion of his heating plant is usually favorable or otherwise, according to the size of his coal and maintenance bills. The proper insulation of pipes is often to bless or blame for the net results.

Johns-Manville Pipe Covering Service contemplates and accomplishes but one result—the prevention of heat loss to the highest degree possible, under known methods. Consider the proportionate reduction of fuel bills.

J-M Contract Departments are located all over the country and are at your service, while specialists are ready to co-operate on any problem that you may have under consideration.

We have specialized on Cold Storage Design and Insulation for years

So complete is the line of approved J-M Cold Storage Materials that any practical cold storage insulation problem can be efficiently solved by their use. Those who solicit the co-operation of this department receive the benefit of our long experience and obtain successful installations without experiment.



J-M Pure Cork Sheet.

All J-M Cold Storage Materials are sold on the same Service Basis as all other J-M Products which assumes complete responsibility for the materials in service.

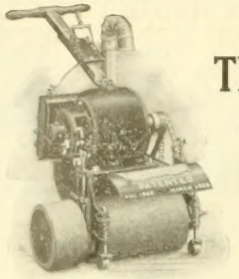
Every J-M Product is Sold and must give Full Service, on J-M Responsibility.

The Canadian H. W. Johns-Manville Co., Ltd.

Manufacturers of Asbestos Roofings, Stucco, Waterproofing, Sanitary Specialties, Acoustical Correction, Cork Tiling, etc.

Toronto **Montreal** **Winnipeg** **Vancouver**

3197 3172B 3081E



WOOD

Test and Try Before You Buy

The Schlueter Rapid Floor Surfacer

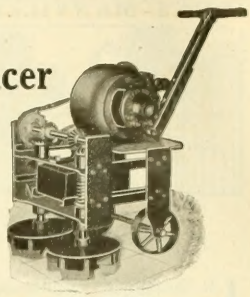
The Schlueter BALL BEARING electric floor surfacing machines for mosaic, marble, composition and wood floors are the most simple constructed machines on the market. Direct chain drive AUTOMATIC DUST COLLECTORS. No gears or clutches to wear. Made in various sizes, using 1, 1½, 2, 3 H.P. Motors.

OVER 15,000 IN USE ALL OVER THE WORLD

Send for prices and free trial proposition
Sold by Leading Canadian Jobbers

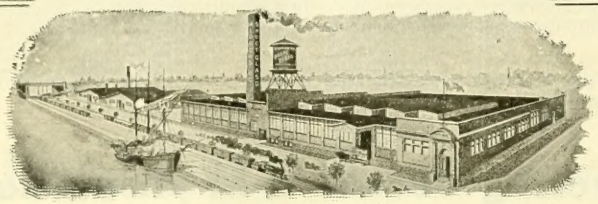
The M. L. Schlueter Company

225 W. Illinois Street, Chicago



STONE

RED **S** BRAND WINDOW GLASS



GLASS BENDERS TO THE TRADE

THE TORONTO PLATE GLASS IMPORTING COMPANY, LIMITED

DON ROADWAY

Plate, Window, Figured, Stained, Wired, Bent, Mirror and Ornamental Glass

TORONTO

MADE IN CANADA

PAGE Flat Sheet Reinforcement

"Lays flat—needs no rods"

Page Reinforcement made in flat sheets 4 ft. wide—any desired length up to 36 feet. Lays flat—never curls or kinks. Needs no weights while pouring. ¶ Made by the pioneer wire workers of Canada. Used on many of the most important building jobs, among which are the following:—

The J. R. Booth Plant, Ottawa; Harris Abattoir, Toronto; Anglo-Canadian Pulp and Paper Co., Huntsville; C.P.R. Retaining Wall, Brantford; Chamblay Dam, Montreal; Welland Canal Lock Welland; Harbour Elevator, Montreal; Soulanges Canal; Power House (Montreal Water & Power Co).

Standard mesh for buildings and bridges, 3" x 6". Also furnished in rolls if desired.

Standard mesh for road pavements 6" x 12". Send us your specifications for low prices and prompt delivery.

THE PAGE WIRE FENCE COMPANY, LIMITED

1137b King St. W.	505b Notre Dame St. W.	87b Church St.	39bDock St.	101b James St. E.
TORONTO	MONTREAL	WALKERVILLE	ST. JOHN, N.B.	WINNIPEG

Write to-day for Free Sample and Illustrated Booklet.

Five Reasons for Subscribing to The Canadian Builder

It publishes plans of actual buildings suitable for erection by the average builder. It aims at raising the standard of the trade in Canada. It contains items of practical value in every department of the trade. It furnishes special articles by leading experts every month. It gives news of Builders' Exchanges throughout the country.

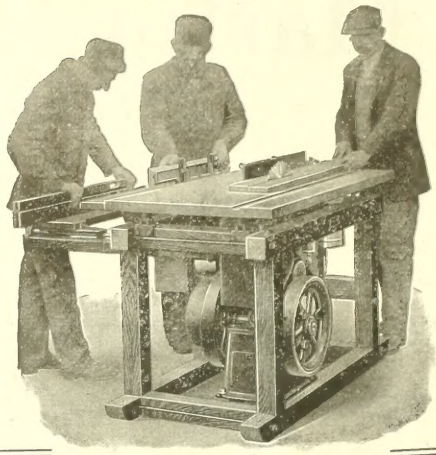
DISSTON Saws and Tools

Highest Award
Panama-Pacific International Exposition

Henry Disston & Sons, Limited
Toronto, Ont.

VARIETY WOODWORKER

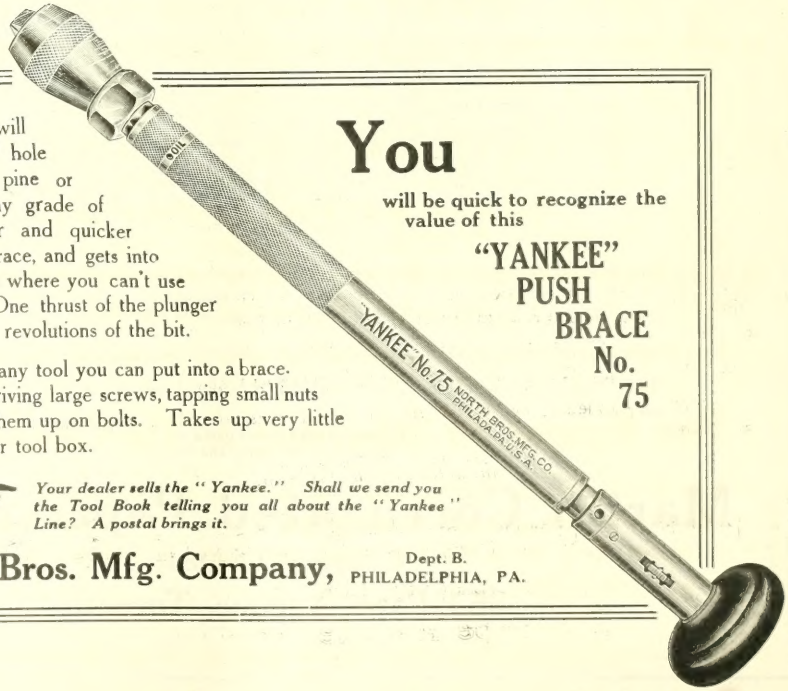
A Planing Mill Right on the Job



Send for Catalogue No. 22

Sawing, Jointing, Planing and Boring can all be done at the same time.
NO CONTRACTOR can afford to be without a Variety Woodworker. It pays for itself several times in a season.
We make a full line of Concrete Machinery and Cement Working Tools.

London Concrete Machinery Company, Limited
LONDON ONTARIO
World's Largest Manufacturers of Concrete Machinery and Cement Working Tools



This tool will drive a 5/8" hole into white pine or 3/8" into any grade of wood easier and quicker than a bit brace, and gets into tight corners where you can't use the brace. One thrust of the plunger means three revolutions of the bit.

It will take any tool you can put into a brace. Great for driving large screws, tapping small nuts or running them up on bolts. Takes up very little room in your tool box.

You

will be quick to recognize the value of this

"YANKEE" PUSH BRACE No. 75

Your dealer sells the "Yankee." Shall we send you the Tool Book telling you all about the "Yankee" Line? A postal brings it.

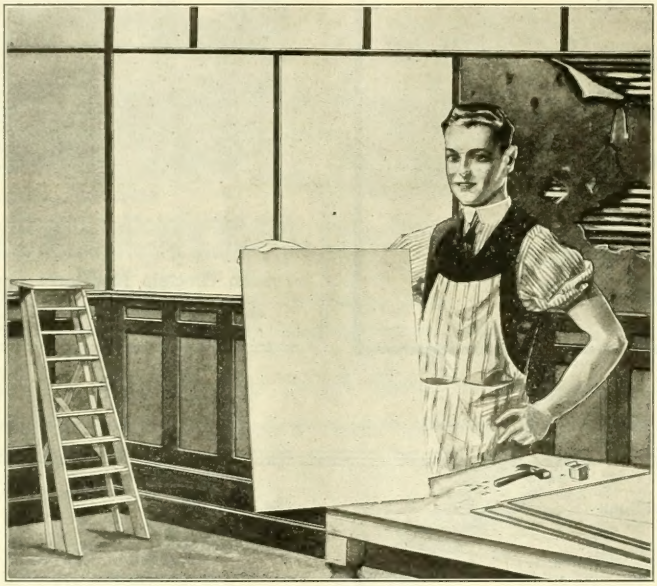
North Bros. Mfg. Company, Dept. B. PHILADELPHIA, PA.

Martin Wall Board

For Interior Finish

Absolutely Sanitary — **Easy to Put Up**
Fire Resisting — **Easy to Decorate**
Cheaper than Lath and Plaster

Made in Canada



By A Canadian Firm

Making an Old Room New

The new Martin Wall Board is made from pure, clean wood fibre by accurate machinery specially designed for the process, which makes it such an ideal interior finish for walls and ceilings in any building, old or new.

Special hardening process causes the board to improve with age.

The Board is finished smooth on one side and burlap finish on the other, giving the user a choice.

If you are not already using it write us for a sample of the board

Martin Corrugated Paper & Box Company, Limited

353 Pape Avenue, Toronto

The Canadian Builder and Carpenter

D. O. McKINNON
PRESIDENT AND GENERAL MANAGER

J. C. ARMER
VICE-PRESIDENT AND MANAGER

GORDON C. KEITH, M.E., M.Sc., CHIEF EDITOR; ERIC A. FORSON, EDITOR; JOHN A. GIBSON AND GEORGE G. COLVIN, ADVERTISING REPRESENTATIVES; R. C. HOWSON, MONTREAL REPRESENTATIVE; E. J. MacINTYRE, WESTERN STATES REPRESENTATIVE; C. G. BRANDT, CIRCULATION MANAGER

Published 1st Week in each Month by

The Commercial Press, Limited, 32 Colborne Street, Toronto, Canada

Montreal Office: 704 Unity Building

Subscription Rate, $1.00 per year in Canada and Great Britain; $1.50 to the United States; $2.00 to Foreign Countries. Subscribers would do us a favor by notifying us if they do not receive the paper regularly, so that the matter may be rectified. In notifying us of change in address, please send old as well as new address. Advertising rates on application.

VOL. 5 TORONTO, AUGUST, 1915 No. 8

Editorial Contents

Building Methods Used in Construction of Provincial Sanitarium at Whitby, Ont. (illustrated). 11
Staff Article.

Position of Radiators in Rooms 12

Boathouse Construction 14

House on Side of a Hill (illustrated) 15

Methods That Save Time and Money in the Laying of Brick (illustrated) 16

Sliding Doors for Cupboards and Lockers (illustrated) 18

Schedule of Ventilation Standards 19

An Inexpensive and Picturesque Arbor (illustrated) 20

Convenient Design of Halifax House (illustrated) 21

Painting Brick and Concrete Surfaces 21

How to Figure Sash Weights 21

Preparation and Application of Stucco . . . 22

Cement Clothes Posts (illustrated) 24

Grape Vine Posts of Concrete (illustrated) 24

Specifications for Cement Top Floors 26

Interesting Roofing Information 26

Chatham Builders Guests of London Exchange 28

Temperature Changes in Mass Concrete. . 28

Building Permits for Month of June. 28

The Elliot

The one Woodworker which any Carpenter or Woodworker can operate.

It will cross cut, rip, mitre, bore, groove, dado, run moulding, cut dental mould, and [illegible] machine.

You can house out stair strings, 16 feet [illegible] and cut and dado inside jambs one cut across.

It swings around to any angle and cross [illegible] swing saw.

Joists and other long stuff can be cut without shoving the plank over the saw.

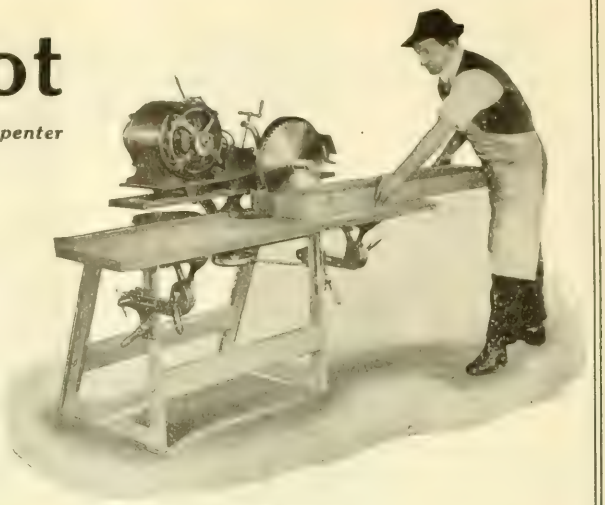
It [illegible] portable machine, easily moved from room to room.

Two hundred and fifty in use in one city [illegible].

Electric power to run it costs $1.50 to $2.50 per month.

Write us for descriptive literature and we'll show you how your production cost can be reduced with the minimum investment.

Be a Builder Agent—We are making a special proposition to responsible builders willing to take orders for Elliot Woodworkers. Big demand and liberal profits assured; ask for details.



Patented 1910—1914

The Elliot Woodworker, Limited

480 Bathurst Street., Toronto, Ont.

2405 Woodward Ave., Detroit, Mich.

ASPHALT SHINGLES
SURFACED ROOFING IN ROLLS

Red—Green—Ruby—Gravel—Grit

Beautiful, Harmonious
Adds to the House.

CANADIAN ROOFING
FOR CANADA

Economical, Lasting
Easy to Lay

Made in Canada by

Canadian Roofing Manufacturing Co., Ltd.

Windsor *At your Dealers or Write us for Samples or Prices* **Ontario**

Also manufacturers of Asphalt Building and Insulating Papers in all grades

Building Methods Used in Construction of Provincial Sanitarium at Whitby, Ontario : : : :

STAFF ARTICLE

This article deals with the application of Alca plaster and Alca cement stucco by means of the cement gun, showing how quickly walls may be covered by this method

ARTICLE III

THE application of Alca plaster and Alca cement stucco by the machine gun is one of the most economical methods of application. Recently the writer visited the Provincial Sanitarium at Whitby, in company with Mr. S. A. Armstrong, Assistant Provincial Secretary, who pointed out the methods of applying the plaster and stucco.

The immense amount of plastering to be done made some quick method imperative. Under the superintendence of Mr. H. J. Hathfield, the cement gun is being used as a labor-saving instrument. An important feature in connection with its use is the standard of quality obtained in addition to the large area covered in a given time.

The Cement Gun Described

The cement gun is an apparatus designed to discharge mortars directly on to the surface to be coated, by means of a hose and nozzle. After being thoroughly incorporated, the dry materials constituting the mix are placed in a specially designed hopper, whence they are blown by compressed air along a flexible hose, at the end of which is a double nozzle. This nozzle is furnished with a separate hose, conveying water, and so arranged that the cementitious materials are mixed with the requisite proportion of water practically at the point of discharge.

It is claimed by the makers that the product of the cement gun, now technically known as "Gunite," is superior in every way to all other mortars. This claim to superiority of product is based upon certain definite chemical and physical principles that underlie the method of application.

In the cement gun process, hydration takes place during the application of the mortar, the cement is in its final resting-place when the setting process begins, and there is nothing to interrupt that continuity of hardening recognized by the best authorities as essential to strength of product.

Using the Rebound Material

It might be thought that a considerable quantity of material would rebound from the receiving surface and that this rebound would prove a serious loss. In practice, however, it has been found that while a certain proportion of the projected material does rebound, the rejected material consists almost entirely of sand and water. And since rebounding sand can be used again after drying out, no loss of material need be sustained from rebound. Furthermore, it has been demonstrated conclusively that this apparent loss by rebound is in effect a beneficial factor, it being a natural and selective forerunner of a dense and homogeneous mass.

Much of the rebound was used in making the cement floors in the basements.

The cement gun discharges the mortar with a nozzle

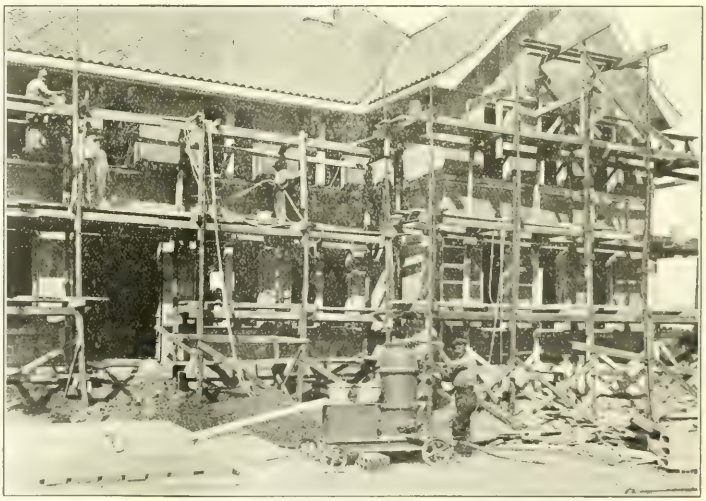


Fig. 10.—House plastered by use of a cement gun. Houses built of hollow tile. Hopper with [illegible] is shown in the foreground.

Square Yards Covered Per Day

The average per day is 325 square yards, and that included working around the windows. The exterior plaster is ½ in. thick, and the average per day is 634 square yards.

Material Used.

The material used for the stucco consists of 4 to 1 mixture of Alea lime and cement and 2½ parts sand. The interior plaster consists of 80 per cent. hydrated lime and 20 per cent. Alea cement.

The high sand-carrying capacity of Alea lime not only reduces the expansion and contraction of the

Operation of Cement Gun.

by one man, followed up by two plasterers who put the

the valves that control the cham-

to mix the materials and feed the hopper.

The Provincial Government has lime quarries, kiln and hydrating plant at the Central Prison Farm, Guelph, the kiln and hydrating plant being shown in Figs. 12 and 13. The equipment includes one Austin gyratory crusher and one Climax jaw crusher for rejections. The capacity is 400 tons per day. The bin has a storage capacity of 600 tons, while the one on the hill has a storage capacity of 200 tons.

* *

Position of Radiators in Rooms*

The location of radiators has a noticeable effect on the heat transmission and the temperature in the room at various points.

Hardly any two conditions are alike and very little data resulting from tests is available.

It has always been considered that the best place to set direct radiators is under the windows or next to the walls which have the greatest exposure. The reason for this is that the greater leakage of air occurs around the windows and also through the wall towards the prevailing winds in the colder periods of the season.

Your committee appointed to investigate the question as to the best location for a radiator is unable at this time to give any experimental data of its own supporting any statement which it might make. What information we give in this report will probably coincide with the opinions of the members.

There are two main points to be considered in the location of a radiator in a room. The ideal position of the radiator would be one where the radiator would give the maximum amount of heat per unit area at a given time and at the same time keep the room in the most even temperature possible, which would naturally cause little draft or currents of air. This position would naturally be different for different kinds of rooms, for instance, a room which was exposed on its narrow side only and was quite deep, a radiator located under the windows of its exposed side only might not give a very uniform temperature to the room and it would probably be found that if the radiation was divided and part placed under the windows and part at the opposite end of the room that a more even temperature would be obtained. However, the efficiency of the radiating surface might not be as good as in the first case.

The construction of the radiator has a considerable effect upon its efficiency as a heat transmitter. From tests we know that the coefficient of emission for different steam radiators decreases as the height is increased by about the .15 power of the height. Again, the emission will vary inversely as the number of columns to about the .11 power. Other tests indicate that a radiator placed perpendicular to the exposed wall is more efficient than one placed parallel to the wall. In this case, however, it might be found that an even temperature would be harder to obtain in the room.

If a radiator is located parallel and next to an exposed wall more even temperature of the room may be obtained by putting a shield over the radiator and thus tending to throw the heated air across the room. This is especially true in the long halls with high ceilings. There is no doubt, however, but what the efficiency of

* Report of committee [illegible] at meeting of American Society of Heating and Ventilating Engineers, by W. F. Turner, chairman of committee, in part based on [illegible] investigations.

Building Methods Used in Construction of Provincial Sanitarium at Whitby, Ont.

Fig. 12. Lime kiln and hydrated lime plant at Guelph.

Fig. 13.—Hydrated lime plant of Ontario Provincial Government.

the heating surface is not as good as the radiator without the deflecting shield.

There have been some tests conducted as to the efficiency of radiators which are encased. From Brabbee we obtain certain figures expressing the efficiency of the heat emission in terms of the heat emission of the radiator when standing free.

Boat House Construction

One of the building problems confronting owners of summer residences on lakes or rivers is the construction of buildings for the housing of the boats that will conform to the general type of the residence architecture and in nowise detract from the natural beauty and harmony of the waterfront. Anybody can knock together a cheap wooden or canvas boathouse that may answer all practical purposes in the protection of the small craft from the elements; but the owner of a picturesque waterfront does not want to mar the scenery of a lake or river view by an ugly building, nor have his neighbors do the same. Before the coming of the motorboat this question did not call for solution, for the sailboat could be moored at the dock or to a buoy off shore, and its appearance there in front of a country residence did not detract from the view or produce a sense of incongruity.

But the modern motorboat is a different product of our times. Its handsomely finished decking must be protected from the rains and dews, and even its engine and machinery last much longer if not exposed to the elements. The mahogany decks of some of these motorboats are as handsome and as finely finished as the case of a piano. They must, therefore, have a proper house for summer, and a good storage place for winter.

There is no small or large lake in the East or West where this problem is not now important. By reason of its location right on the waterfront, the boathouse is really more conspicuous than the residence itself. It may, therefore, mar or make the scenery of a lake or river.

Cheap boathouses have sprung up in places, and at a few points they have sadly injured the view. On the other hand, the owners of the country homes there have in a great number of cases co-operated in protecting their views, and the appearance of the numerous boathouses has not disfigured the landscape.

The Ideal Boathouse

The ideal boathouse, says a writer in the American Carpenter & Builder, consists of something more than a covered slip to run the boat in for the night. It includes a covered slip, with a platform on either side for landing, a tool-house at one end where one can make ordinary repairs to the boat or machinery, a storage closet for cushions, awnings and accessories, a contrivance for lifting the boat out of water overhead, and a general dock or landing place on the outside of the house. A good many of the more ambitious boathouses are two-storey affairs, with rooms above for resting on warm days or even for dancing purposes or for card playing. These upper storeys are put to a variety of purposes, and are often used for sleeping and even cooking purposes on special occasions.

A boathouse of this character must have a firm foundation on which to rest. The usual way is to construct a foundation of timber cribbing filled in with stones, and topped off with cement and boards. The frame of the house is then laid on this foundation in the usual manner. A stone or concrete foundation, however, must have the sides protected with boards, or the boat chafing against it will quickly cause irreparable injury.

Providing Winter Storage for Boats

The winter storage of a motorboat must always be considered in building a house for summer use. Very little extra cost is necessary to provide storage facilities in the building. The chief essential is that sufficiently strong cross-beams are placed over the bow and stern to lift the craft out of the water with tackle. Slings are placed under the boat at bow and stern, and by means of a chain or rope tackle it is lifted above the level of the inside landing platform. Then three planks, two or three inches thick, are passed under the boat with ends resting on the top edge of the platform. These planks should be placed at the bow and stern and the middle of the boat. The craft is then lowered gently until the keel rests on the planks. The tackle is tightened so that it carries a part of the strain. There is no possibility then of any part of the hull being strained while in winter storage, for the weight is distributed over the three planks and the two end tackles overhead. Hanging a boat by tackle alone is unsafe, for if anything should happen to the rope or chain the boat might drop down and smash some part of it. In the spring the boat can be launched within a very short time in the boathouse slip, or the hull can be painted and caulked up while resting on the planks. All the old difficulties of hauling the boat out of the water on some sandy beach to paint and caulk it up are thus avoided. Not only that, but the boat can be hauled out of the water any number of times in the summer for inspection or repair of the hull underneath.

Watch the Foundation

In the construction of any boathouse a good deal depends upon the depth and the nature of the water. Where the land drops off suddenly at the water's edge, and the depth exceeds fifteen or twenty feet, the cost of building a foundation for the boathouse may equal or even surpass the total cost of the house itself. Consequently in making estimates upon the cost of a boathouse it is necessary first to study the nature of the water approach. In some locations the water is often so deep within a few feet of the land that the work of building boathouses is difficult.

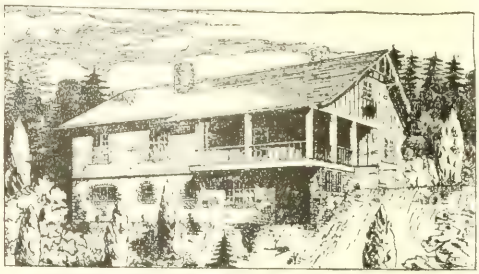
Where the bottom of the lake or river is muddy or sandy piles may be driven down to form the foundation of the piers, but where the bottom is almost entirely of rock near the shore piles cannot be used very well. The foundations are, in the latter case, made almost entirely of timber cribs filled with stones and sunk in position. They withstand the action of the winter's ice remarkably well, and a few slight repairs made each spring are sufficient to keep the foundations in good condition indefinitely.

"Why are children so much worse than they used to be?"

"I attribute it to improved ideas in building."

"How so?"

"Shingles are scarce, and you can't spank a boy with a tin roof."—Life.



House at Bowness, Calgary, built on side of a hill.

House on Side of a Hill

Architects, Holman & Gotch, A.R.I.B.A.

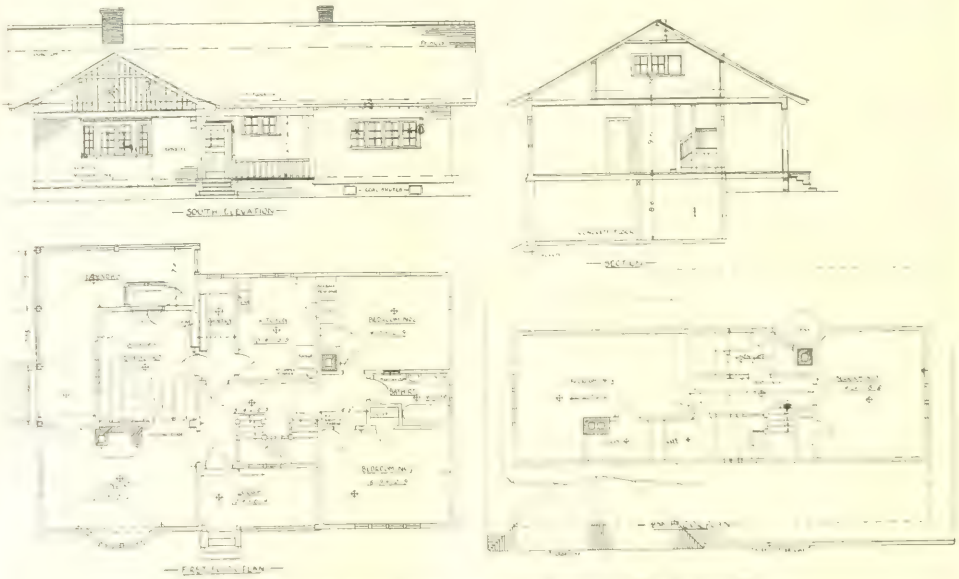
Designed for G. E. Rodwell

THE plans shown herewith show how one firm of architects dealt with the design of a house to be erected on the side of a hill. This house was designed for Bowness Park, Calgary, Alta., and is of a somewhat semi-bungalow style.

A verandah 7 ft. 11 ins. at the back and 7 ft. 7 ins. at the end overlooks the ravine. This verandah overhangs the lower wall, and is supported by brackets.

The door below the verandah suggests a plan for housing an automobile, without the extra expense of building a garage. In fact, this scheme has already been adopted by many with houses similarly situated. The great advantage, in addition to saving initial expense of garage, is the simplification of the heating problem. With the furnace situated in the basement, it is only necessary to keep the door open between the basement proper and the garage. Also, in rainy weather, it is not necessary to go out in the rain to get the motor car.

The dimensions of the various rooms are shown on the plan.



Plans, elevation and section of a Calgary house built on the side of a hill at Bowness Park.

Methods that Save Time and Money in the Laying of Brick

In this article is shown how a large construction company, by keeping careful cost records and by the use of special carrying devices and other assistance, saved considerable time and money.

DURING the past year the Aberthaw Construction Co., Boston, has been called upon to erect 5 or 6 brick buildings, the aggregate amounting to several million brick. Studies on cost saving as compared with the usual method of handling have given particularly gratifying results. These studies might be divided into three parts—careful cost records on two buildings erected in Connecticut, with the usual hods for carrying brick and mortar; the use of special brick-carrying devices and other means of assistance to the bricklayer on a group of buildings in Maine; finally,

Fig. 1.—Car alongside the brick unloading platform.

Fig. 2.—Showing the wooden trays for carrying brick.

an extension of the above studies and refining of the methods on another building in Connecticut. The principal effort so far has been on getting the brick and mortar to the mason. Studies in the actual laying are to follow, but at present progress has been along the more fundamental question of transportation.

Fig. 1 shows the car alongside the brick unloading platform. When the car has to be unloaded faster than the brick can be used on the job, the brick are thrown out into a pile as shown at the right. When, however, brick can be moved directly from the car to the job, they are loaded in the car upon wooden trays, such as shown in the foreground in Fig. 1 and elsewhere in the accompanying illustrations. Each of these trays has been made to hold 18 brick, there being ten set on edge in the lower row, six on edge and two flat in the upper row.

At first, only two trays of brick were handled on this job, these being placed upon the wheelbarrow, as shown in the illustrations. Ultimately, however, it was found possible to carry three trays, or 54 brick, upon each wheelbarrow, with no more fatigue on the part of

Fig. 3.—Carrying brick to the job.

Fig. 4.—Inclined plane leading to the scaffolding which extends around the building.

the man than he experienced in the carrying of a hod of sixteen brick. This means that the brick were carried more than three times as rapidly, hence that three times as many brick could be transported the same distance by the same force; twice as many brick 50 p.c. further by the same force, or such other combination of quantity and distance as might be found necessary. The brick were carried up an inclined plane to the scaf-

folding around the handles, as shown in Fig. 4. This proved just as easy for the man as carrying a hod up a ladder, and still retained the advantages of handling more than three times as many brick per man. In the next development of the barrow, shown in Fig. 5, the centre of gravity was brought considerably lower; this shows how the three trays are loaded. Since that photograph was taken, a short length of "2 by 4" has been placed upon the barrow platform just in front of the pipe handles, thus throwing the centre of gravity of the bricks farther forward and more nearly over the wheel. This makes a better balance and eases up the work on the man.

The barrow, as will be seen from the illustrations, is an adaptation from the ordinary scoop barrow used for handling broken stone, lime, sand, etc. The handles have been made of one long piece of one-inch wrought iron pipe, bent in five places, and fitted with the necessary braces, journals, etc.

How the Mortar is Handled

Mortar is handled in much the same way. Fig. 4 shows a barrow with three pans of mortar being taken

Fig. 5. Showing how the three trays are loaded.

Figs. 7 and 8.—Views taken on the scaffold which extends about the building showing the way in which the materials were wheeled to the various benches located at intervals on the scaffolding.

up an incline. This indicates the shape of barrow used for this purpose. Further study of the operation resulted in the Connecticut barrow shown in Fig. 6, identical with the brick barrow in Fig. 5. This has the advantage of placing the centre of gravity of the mortar a little closer to the axis of the wheel. In both cases the mortar pans contain the same amount—about 80 lbs. The pans are a little different in construction, those in Maine having a wooden cleat across each end for handling, while those in Connecticut have an iron handle. The latter have also a sheathing of zinc around the bottom to keep the water from leaking out.

Use of Elevators

On the Connecticut job no inclined plane is used, all brick and mortar above foundations being sent up in special elevators located at two corners of the building. Though each elevator, operated by its own motor, can handle in one day about 40,000 brick, neither one has yet been pushed anywhere near capacity. With a speed of travel of about 50 ft. per minute, the trays or pans are carried up at intervals of eleven seconds. The man with the wheelbarrow loads his trays upon the elevator at the bottom, while one man at the top takes them off and two other men distribute them to the masons working on the platform. By the combination of the wheelbarrows and the elevators, the same

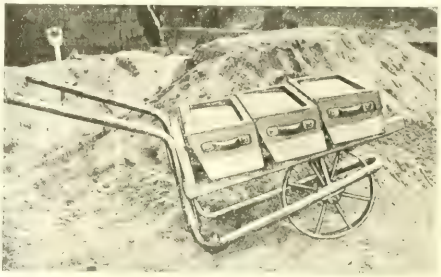


Fig. 6. Barrow with three pans of mortar.

gang of eighteen masons who used eighteen helpers on the first job are now laying more brick per day with from nine to eleven helpers, depending upon the condition of the work—a clear saving of from seven to nine helpers every day.

Saving of 7 Cents per Cubic Foot

Making due allowance for distances of travel and for quantities used, the scheme as finally worked out has resulted in a saving in labor cost of about 7c. for each

cubic foot of brick laid in the wall. This saving has been made partly by arrangements for permitting the mason to lay brick faster, but the main part of it comes from the transportation of brick. As this is more than one-quarter of the labor cost on the first three jobs, it is evident that the owners of the buildings have benefited very greatly from this study, for all of these buildings have been erected on the "Cost-plus-profit" basis.

The other illustrations show the way in which the materials were wheeled around the scaffold to the

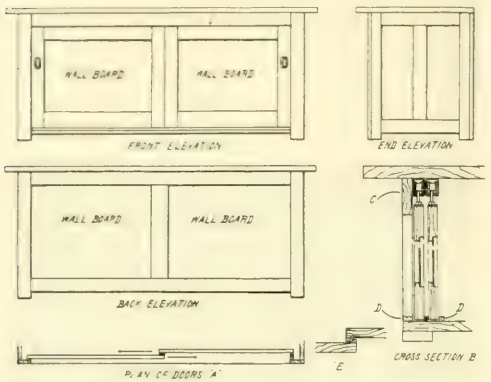


Fig. 1.—Work table showing details.

benches, 15 inches high, from which the masons work, and how convenient the mortar tubs and brick trays are for the masons. One refinement of the system has been the loading of the brick upon the trays all with one side to the right. The mason, upon picking up the brick, knows exactly how it is going into the wall, without having first to turn it over and over in his hand and find the "right side up."

Many of the ideas which have been put into practice in this way have been brought out before, notably by Frank B. Gilbreth; but in very few cases have they been given so convincing an actual application on large buildings. The results have been so satisfactory to the building owners in money saved, and to the Aberthaw Construction Company in the sense of a good job well done, that the studies are being continued with the idea of making a still better showing in future operations.

Sliding Doors or Cupboards and Lockers*

Those who have occasion to build articles of furniture, such as cupboards, work-tables and cabinets of various kinds, will be interested in the description given below. A departure from the methods used by many carpenters will be noted particularly in the method of hanging the doors and also in the construction of the doors and panels. While the articles described and their application are not entirely new, they are not as generally used for the purpose mentioned as their merits warrant.

The work-table shown in Figure 1 has two doors closing the entire front. The construction is clearly shown in the illustration, and so it will not be necessary to enter into a detailed description, but a few points of special interest will be enlarged upon. The top and end sections are made entirely of wood, but the back is a wood framework with panels of wallboard. Two inside shelves provide space for storing a large quantity of material. The stiles, top and bottom rails of the doors only are wood, the panels being made of one piece of wallboard. A heavy stiff grade of wallboard, is especially convenient for this purpose, as a panel of any size can be made of one piece without gluing or finishing of any kind. It is light in weight, holds its shape well, and can be painted to give a pleasing effect, which harmonizes well with the finish of the woodwork. As an economy it takes precedence over any other material, not only in first cost of raw material but also in the saving of labor costs for constructing the doors and panels.

Special attention is directed to the method of handling the doors as shown in the plan "A" and the cross-section "B," Figure 1. The cross-section "B" is drawn to a larger scale. Sliding doors operating on two parallel tracks take the place of doors hung on hinges, as is the usual custom. The doors, of course, are very light and a small door hanger and track made especially for this purpose is used. The track is of the trolley or box-shaped type, about 1⅜ inches wide by 1⅞ inches high, and it entirely encloses the track. A larger sketch of the hanger is shown in Figure 2. The wheels are made of either fibre or steel, and have ball bearings, which make a very easy operating device. Vertical adjustment, as well as a slight lateral adjustment, is provided, so the correct alignment and proper working clearances may be easily obtained.

The track is screwed directly to the bottom of the table top. A facing strip "C" serves the triple purpose of reinforcing the table top and stiffening the entire structure, concealing the track and closing the

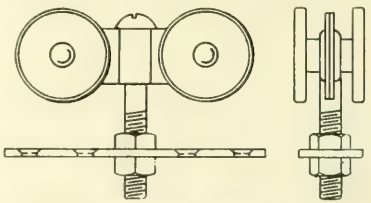


Fig. 2.—Hanger used for doors in Fig. 1.

space between the top of the doors and the bottom of the track. Narrow strips of wood "D" form guides for the bottom of the doors. A piece is attached to the side of each door where they meet at the centre, as shown at "E," Figure 1. These strips overlap each other when the doors are closed, making a tight joint and at the same time allowing plenty of working clearance between the doors.

Half the front can be opened at any time and this without swinging the doors out into the room. Any kind of swinging cupboard door is open to objections, though of course it must be admitted that the hinged door cannot always be eliminated; but these objections would be emphasized in doors as wide as the ones shown in this particular case. A door as wide in proportion to its height as those shown in the illustration would be likely to sag, lose its shape and drag, if hung with hinges. On this particular point the sliding door has a decided advantage, because of its being suspended from the top at two points, which does not cause any twisting or distortion of the door.

A second feature which should be considered is that

*E. J. G. Phillips, engineer, Richards-Wilcox Co., in National Builder

[illegible] a little rough usage when [illegible] or someone accidentally running into them, would be almost certain to damage either [illegible] the hinge fastenings. The sliding doors never project into the room or expose themselves to acts of carelessness as mentioned above.

The third point is the ease of operation. Compare the long swinging movement necessary to open the hinged door, with the mere touch required to start the sliding doors with their ball-bearing hangers.

The convenience of making necessary adjustments can be named as a fourth advantage. When the swinging door begins to sag and scrape at the bottom, it becomes necessary to get a saw and plane to dress down the door; but with the sliding door, the adjustments

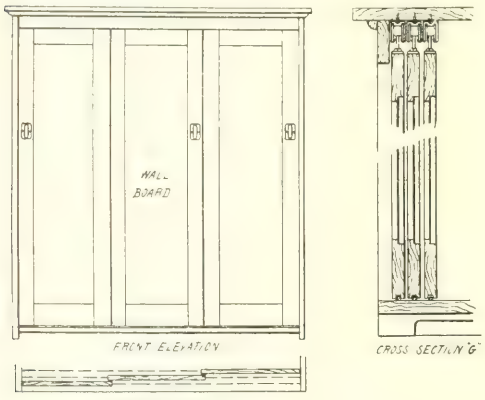


Fig. 3.—Wardrobe constructed along same lines as work table.

(and these are seldom necessary after the initial adjustment when hanging the doors) only require the turning of a screw and all is well.

Locker With Sliding Doors

Figure 3 illustrates a wardrobe constructed along the same general lines as the worktable. The panels of the doors and in this case the entire back is constructed of wallboard. The doors sliding on three parallel tracks close the entire front. A plan of the doors is given at the bottom of the illustration referred to. Strips similar to those shown at "E," Figure 1, are attached to the overlapping stiles of the doors to make a tight joint. The stiles of the doors are 7/8-inch thick, finished in golden oak, and the panels are painted to harmonize with the woodwork.

A horizontal cross-section of the doors, tracks and bottom guides, drawn to larger scale, is given at "G," Figure 3. The hangers and tracks are the same as previously referred to. The bottom guides are narrow strips of wood working in grooves ploughed in the bottom of the doors. Two-thirds of the front can be opened at any time. The doors slide easily and never extend into the room to interfere with anyone passing and do not occupy unnecessary space.

The two articles described have been in constant satisfactory use for a couple of years and are typical of a great many places where these little sliding door hangers can be used to good advantage. In offices especially, filing cabinets, shelving, card and circular cases as well as other articles of furniture, require [illegible] doors, and in many cases the hinged door is really objectionable. For these, sliding doors such as described above will be found very satisfactory, and the live wires among carpenters and cabinet makers doing a jobbing business will undoubtedly find occasion to make use of some of the suggestions offered.

* * *

Schedule of Ventilation Standards

A valuable statement of ventilation standards is to be found in a report submitted by a committee appointed by the American Society of Heating and Ventilating Engineers, at the annual meeting in New York in January, 1915.

This committee was directed to prepare a schedule of minimum ventilation requirements applying to public and semi-public buildings. The requirements are based on minimum floor space per occupant, minimum cubic space per occupant, minimum hourly air supply per occupant, rules governing air distribution, temperature regulation, heat sources, provision for mechanical exhaust where required, reduction and control of excessive temperature and humidity. The standards set by this committee are as follows:

Class of Building	Floor Space Sq. Ft.	Cubic Space Cu. Ft.	Air Supply Cu. Ft.	Temperature Range Degs. F.
Theatres	6	90	1,200	60—72
Auditoriums	6	90	1,500	60—72
Court Rooms	6	90	1,500	60—72
Primary Schools	12.5	150	1,800	60—72
Schools and Colleges	15	180	1,800	60—72
Factories	25	250	1,500	60—72
Manual Training	25	250	1,500	60—72
Work Rooms	25	250	1,500	60—72

Air Distribution.—The distribution and temperature of the air supply to be such as to allow the maintenance of required temperature without uncomfortable drafts or any draft lower than 60 degs. F. The carbon dioxide determination to apply as a test of proper air supply and distribution. The maximum allowable carbon dioxide content not to exceed ten parts in ten thousand parts of air.

Temperatures.—The temperature of air in occupied rooms in all classes of buildings to be not less than 60 degs. F. nor more than 72 degs. F. during periods when artificial heat is required.

Heat Sources.—Any source of heat which does not contaminate the air supply nor conflict with local requirements of the departments of health, fire, electricity, or building, may be used both for warming air supplied ventilation and for heating by direct radiation.

Mechanical Exhaust.—Where required on account of dust, fumes, gases, vapors, fibres, or other impurities being generated or released, mechanical exhaust systems are to be provided of proper design and to be operated as required to remove such impurities.

Excessive Temperature and Humidity.—Where excessive temperature or humidity occurs as a result of the location or the nature of the work done, or processes employed, provision shall be made for the reduction and control of such excessive temperature and humidity.

* *

The man who only asks for new appliances when he actually needs them should have but little trouble in getting what he asks for.

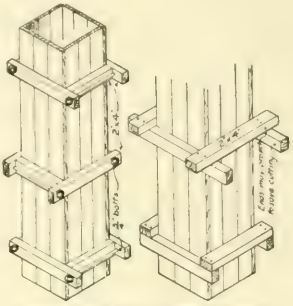
An Inexpensive and Picturesque Arbor

The attractive arbor shown in the picture below is simple and easy to construct. The arbor consists of [illegible] concrete columns surmounted by undressed timber. It was built by Mr. J. Fletcher Street, a Philadelphia architect, at his suburban home in Beverly, New Jersey.

To construct the columns required three cubic yards of cinders and three barrels of cement. The work was done by one man in four days. This mixture, however, is too lean and unsafe for the unskilled worker to use, and the proper proportions of cement, sand and stone are given below.

The arbor is 8x12 feet. The columns are 7½ feet high, 2 feet at the base and 18 inches at the top. Each has a foundation of concrete 2 feet 6 inches each way—in other words, a concrete cube of that dimension. A square form of boards was erected and corner pieces inserted to form the octagon. It was intended to give the columns a finishing coat of plaster, but they looked so well in their crude state that it was never applied.

Simple designs of this type compare favorably with the most costly and ornate conceptions, and are made at greatly reduced cost. Had the columns shown been elaborate in design and surmounted with dressed timbers it is questionable whether the arbor could have been built for less than $100. Moreover, many people of good taste would prefer the more rude and simple patterns. These columns take their place in the landscape with the unobtrusiveness of a tree, while their rough surface is better adapted to the growing of vines



Construction details of form for casting concrete columns.

than columns possessing a smooth surface. In fact, the columns on the world-famous terrace at Amalfi are even more simple than these octagonal forms.

Two types of forms for constructing columns are shown in the line drawing. The form at the left is more economical where it is the purpose to use it many times, but for a single operation, such as the arbor described, the form at the right with braces nailed instead of being fitted with bolts would be more economical.

The concrete could be mixed in the proportion of one part Portland cement, two parts sand, and four parts stone or screened gravel, as cinders are not always available on the farm. It is important to remember that cinders do not mean ashes, so it would be better to use the stone or gravel.

Concrete arbor at Beverly, N.J.

Keeping in Touch With the Architect

Let the world know what you are doing and invite everybody to inspect your work. In "getting next" to busy architects nothing will put you in their good graces more quickly than showing them a good job which you and your men have accomplished. "If he can do that kind of a job for Jones," reasons the architect, "he can do a good job for me"—and so the contractor finds his chief asset in the good work he has done. When some unusually good piece of work is under way and your men are carrying it on efficiently, invite your architect acquaintances out to see the job.

Don't you wait until the building is completed, but arrange to have them see the work while the "wheels are going 'round." Fireproof houses are particularly interesting just now and always make a hit with members of the profession. Let them examine your floor construction—show them how easily it can be built and how enduring it is when finished.

Convenient Design Halifax House

The accompanying illustration shows the features of a Halifax house erected by Mr. E. Gibson, 152 Spring Garden Road, Halifax. The architect was G. H. Jost. The arrangement of the rooms and the sizes of same are clearly shown in the line cut.

This house is designed to utilize all the space between the four walls. The pantry is under the stairs, and the entrance to the cellar is through a porch at the back of the kitchen. Fireplaces have been provided in the dining room and parlor.

Painting Brick and Concrete Surfaces

In painting brick surfaces, mixed paint of the desired shade, well thinned with raw linseed oil, should be applied for first and second coats. The final coat may be in brick red or yellow cream. This finishing coat is a specially prepared paint to prevent absorption of moisture through the walls. Some paint makers use the same material for the final coat on brick walls as for walls of concrete or cement.

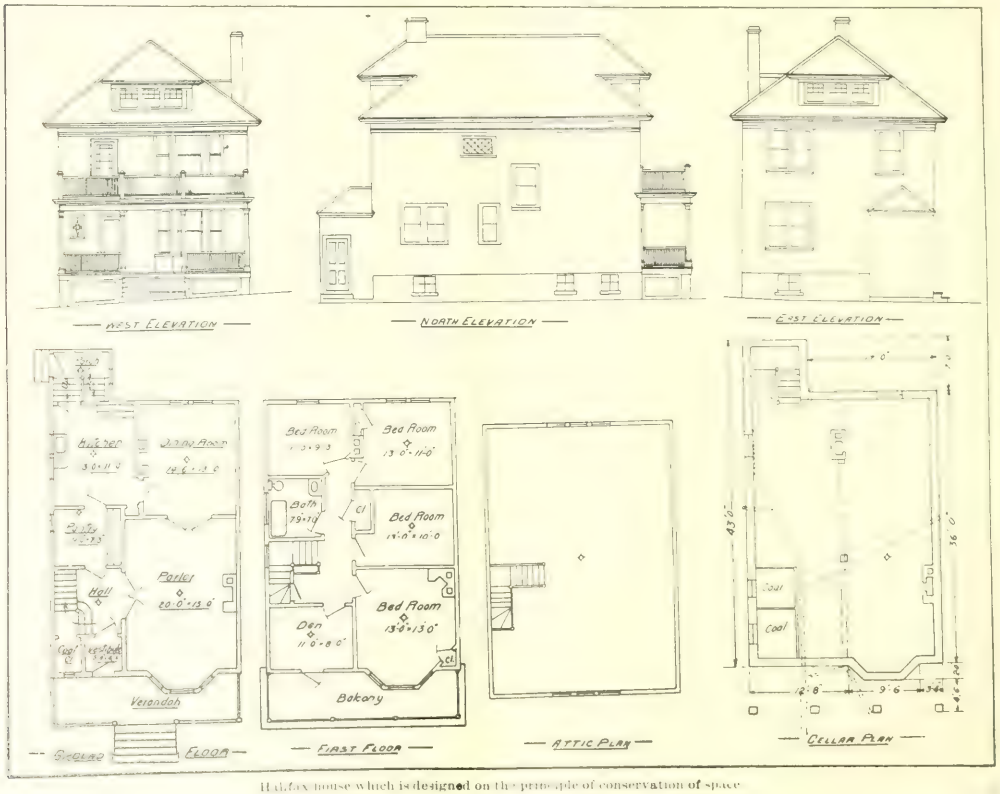
These new concrete finishes provide a waterproof surface that keeps the wall free from rain streaks and dirt. There are also excellent cement floor finishes which obviate the propensity of such floors to gather and spread a fine gray dust. They will stand hard usage in garage, machine shed, etc., without cutting through and also render the floor damp proof.

For a monolithic silo of concrete, the green-stone, light gray, or cream colored concrete wall finish will prove a good color selection. To apply this wash color, the surface must be clean and dry, free from dust and grease. The liquid can then be applied freely from the can. Ordinarily two coats are sufficient, but when the concrete is very coarse or is exposed to unusual dampness, three coats are better. Some paint makers advise a priming coat and cement coating, as this fills the pores and makes the concrete waterproof. In very rough work a first coat of cement and water, with the addition of some sand, acts as a good filler.

How to Figure Sash Weights

The weights ordinarily used for balancing windows are made of a cheap grade of cast iron, generally cylindrical in shape, with an eye cast in the upper end to receive the window cord. Such weights are never of greater diameter than the thickness of the sash to be held.

The length of the sash weight in inches required to balance a given weight may be found by dividing the given weight by the values in the following table. This



Halifax house which is designed on the principle of conservation of space

Table is taken from "Kidder's Architects' and Builders' Pocket Book."

Weight of Iron Sash-Weights per Lineal Inch

[illegible]	Round Cast Iron. Pounds.	Square Cast Iron. Pounds.
[illegible]	0.32	0.40
1½	0.46	0.58
1¾	0.62	0.79
2	0.81	1.04
[illegible]	1.03	1.31
2½	1.27	1.62
[illegible]	1.54	1.96
3	1.83	2.34
3½	2.50	3.18
[illegible]	3.26	4.16

To the result thus obtained one inch should be added to allow for the eye of the weight.

The approximate diameters of common stock weights are as follows: For weights of 8 pounds and under, 1½ inches; 8 to 16 pounds, 1¾ inches; 16 to 20 pounds, 2 inches; and 20 to 30 pounds, 2¼ inches.

The principle involved in determining the weights to be used in a given sash is that the weights in passing over the pulleys at the top tend to counterbalance the weight of the sash itself. Thus, it is seen that the amount of the two weights should be about the same as that of the sash. Generally, the weights for the upper sash are used about one-half pound heavier than the sash, while those for the lower end are about one-half pound lighter. This difference in weight tends to hold the window closed, but does not impose any considerable weight to be lifted to open the window.

In determining the weight of the sash itself, the weight of the glass may be used as one pound per square foot for single-strength glass, 1 1-3 pounds for double-strength glass, and 3½ pounds for plate glass. To find the weight of the wooden sash, Kidder gives the following rule: Add together the height and width of each sash in feet and multiply by 2.1 for 2¼-inch sash, 1 2-3 for 1¾-inch sash, and 1 1-3 for 1¾-inch sash. If the exact weight is desired it can only be obtained by weighing each sash carefully.—American Carpenter & Builder.

Disston Saws Awarded Prizes in Twelve Classes at Panama-Pacific

First prize in twelve classes was awarded to Henry Disston & Sons, saw manufacturers, of Philadelphia and Toronto, by the Panama-Pacific Exposition. They exhibited in twelve classes of saws and tools, and won in each class. The Disston exhibit at the fair is located in the Palace of Manufactures, and is one of the chief features of the immense hall. Instead of being merely a showing of various kinds of tools in cases, it consists of a huge platform, the base of which is a horizontal circular saw, which revolves slowly, so that the exhibit erected upon it is continually moving before the eyes of the spectator. Upon the huge saw stand four immense keystones, on the surface of which are attached all kinds of saws. Above it all is a geographer's globe of leaded glass, surmounted by an eagle. The globe revolves in the opposite direction from the rest of the exhibit.

Preparation and Application of Stucco*

Stucco should never be applied in freezing weather. If the water freezes before the cement has set, the stucco will not harden. Nor should stucco ever be disturbed before the cement has set, otherwise it will not adhere to the surface to which it is applied. While a frame building covered with stucco is in no sense fireproof, such a covering does act as a fire retardant.

Stuccoing should always be started at the top of the building and the work carried downward to some projecting member or recess. If it is impossible to complete an entire wall at one operation, the work should be halted at some division line, such as a band, window or door. Three coats of stucco are desirable if the finish is to be smooth. For a rough-cast or pebble-dash

On a club house verandahs and balconies are essential. This photo shows the club house at Welland, Ont. The columns were supplied by Batts Limited, West Toronto.

*Extracts from an article by Oswald C. Hering, A.I.A. Reproduced by courtesy of Concrete-Cement Age.

finish, two coats will suffice, but the thickness of the stucco should not be less than 1 inch.

Producing a Smooth Finish.

A smooth finish is secured by bringing the final coat to an even surface with a wood float; under no circumstances should a steel trowel be used for this purpose. Rough-cast and pebble-dash finishes are obtained by applying gravel or pebbles, mixed with cement, sand and water, dashed on with a paddle or a whisk broom after wetting down the under surface. This gives a very pleasing texture and a variation in tones that overcomes the monotony of a perfectly smooth and uniform surface.

"Dry-Dash" Finish.

One of the most interesting and attractive of the various surface treatments employed by the writer is what is termed the "dry-dash." The first, or "scratch" coat is applied in the usual manner and immediately followed by a second or "brown" coat. While still wet, aggregates of marble and stone, selected for their size and color, are dashed upon and partly embedded in the soft background. For this work the following specification is given—but it is coupled with a warning that the effect cannot be obtained by an unfamiliar and untrained hand:

After thoroughly wetting the outside face of the tile, cover with a scratch coat composed of 3 parts sand to 1 part lime that has been blended for three weeks, adding some hair and 1 bbl. cement to 1 bbl. of lime mortar. Follow up with a coat for dashing composed of 1 part sand, 1 part lime mortar and 1 part cement. While wet, dash with crushed stone in sufficient quantity to cover the walls. On outside frame walls covered with wire lath apply scratch coat as above and follow up with a brown coat of the same mixture but without the hair. Then apply coat for dashing as above and finish as above. Allow ..... dollars a ton for the crushed stone, to be of the size, kind and color selected by the architect.

Consider the Weather.

It should be borne in mind that stucco is subject to the action of the weather, including heat, cold, moisture and aridity, to shrinkage, settlement and all the ills to which the exterior walls of a building are heir.

The fine hair cracks that frequently appear upon the finished surface of stucco, called crazing, are generally due to the too rapid evaporation of the water, before the cement has had time to set. These cracks may be largely avoided by stuccoing on a damp, cloudy day, when there is little or no wind, or by protecting the stucco from sunshine and wind by screens or other device. An occasional crack, if it is not too large or due to structural defect, is not a serious blemish. In fact, a flawless, one-toned wall is apt to be painfully monotonous and must be partly covered with vines before it can lay claim to any beauty. Generally speaking, a completed stucco house looks its worst at the moment of completion.

Stenciling Stucco.

Stenciling with colored cement washes is an interesting way of treating a smooth stucco surface, but this method of decoration is more usually confined to porches, loggias and portions protected from the action of the weather, for the range of coloring matter in present use includes none of any great permanence when exposed to the elements. There has just been placed upon the market, however, a paint apparently possessing unfading as well as waterproofing properties which has led the writer to use it in coloring the stuccoed walls of houses on which he has done work. In one case the surface is white rough-cast and a rose-pink paint has been applied with a quick stroke of the brush to color rough projections only, allowing the pockets between the pebbles to exhibit the natural color of the stucco. When Dame Nature takes a hand and films the surface with the grey tints of Time—a sparkling and mottled pink, white and grey effect will be obtained such as would not be possible in a one-tone mixture or with a thorough coat of paint.

Use Colors That Will Withstand the Elements.

It may be said of colored stucco that, owing to the lack of experience or courage, very few examples are to be seen in America that excite favorable mention. When the work is exposed to the weather, the mistake is invariably made of selecting such shades and tones as are effective at the moment, forgetful that the ravages of time, the action of the sun, wind and water conspire to bleach and the dust to blacken, the chaste tones so fondly conceived. More daring is required of the architect and more confidence of the owner. Time should be discounted, even at the expense of a year's nervousness over a glaring chromatic display.

Use Only Mineral Colors.

When stucco of a decided color is desired (aside from painting it) only mineral colors should be employed, and these had better be used sparingly and limited to carbon black, ochre and red oxides of iron and their combinations. It should be borne in mind that coloring matter reduces the strength of stucco. Very pleasing shades may be obtained, however, without the admixture of pigments, by using an aggregate of crushed stone, brick or marble, and white or yellow sand or gravel mixed with grey and white cements. If pigments are used they should be mixed with the sand or gravel and then with the cement. A uniform mixture cannot be obtained if any of the ingredients are wet. Mixing in paste form is sure to distribute the color unevenly, and the trowel striking a lump of color will produce a spot or streak. By mixing the ingredients dry, a sufficient amount for the entire operation may be obtained and kept until needed, pure water being added to such quantities as may be immediately required. This method prevents the unsightly unevenness in color that generally occurs when batches are mixed at different times. Smooth surfaces that are floated or troweled rarely show a perfectly even color, no matter how accurately the ingredients are proportioned nor how carefully they are mixed. No two men use a float or trowel alike, nor can one man continually preserve an even degree of pressure; consequently different surface textures occur from the varying amounts of cement or fine material that come to the surface, due to uneven pressure, producing a difference in shade or color. Freezing will also change the color of stucco, as will sunlight, a dry wind, or cloudy and rainy weather. A moist, cloudy day is the best for a good stucco finish, and where it is exposed to the sun or wind the stucco should be covered with damp cloths hung to protect it, and invariably the whole of one unit of space should be completed in the same operation.

Cement Clothes Posts

The trend of the times in the construction of all outdoor accessories for the home is to make them durable. They will then give to the property the well-kept look which appeals to all when the question of value, neatness or tidiness is considered. The subject of clothes posts usually is given no consideration, but on contrasting the general appearance of many yards one is immediately struck with the idea that a post such as shown in the illustration would be a positive economy and advantage. Many a good housewife all too often finds that, due to a weak wobbly post, her clean linen has been blowing all over the back yard until its condition meagres description.

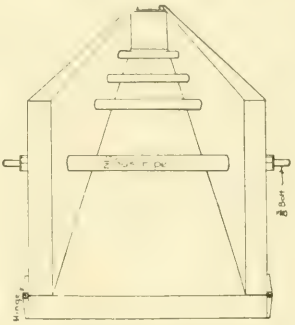
The post should be about 11 feet long, 8 inches square at the top and 12 inches square at the base, and should be firmly embedded at least three feet in the ground. It should be reinforced with ¼-inch round rods placed in each corner so that they will come 1½ inches from the outside surface.

The form for the post may be made of 1-inch lumber cut so as to give the dimensions noted above, or if a smooth floor or walk is available, only the sides and ends of the box need be used, the floor or walk serving as the bottom of form.

Stiffening cleats should be placed across the open side of mould to keep the side forms from bulging when the concrete is placed in the mould.

Do not remove the form from the green post until it has thoroughly hardened, which generally requires two or three days. Allow the post to cure or harden for one week before erecting.

During the first two days keep the post wet and cover with canvas, burlap, straw, or other clean material, and dampen it thoroughly each day for about a week.



Form for casting concrete trellis posts.

The form should be oiled or soaped before the concrete is placed.

The mixture used should be in the proportion of one part of cement, two parts of sand, and four parts of rock or gravel not greater in size than 1 or 1½ inches Bank run gravel should not be used, but should be screened, passing over ⅜-inch and 1½-inch mesh sloping screens, the material which passes through the ⅜-inch screen being called sand and through the 1½-inch screen and retained on the ⅜-inch screen gravel. All measurements should be made with the material poured loosely into the measuring box, and the box, when full, should be completely leveled. If, for any reason, the concrete stands thirty minutes before using, it should be thrown away, for cement, once it has partially set, makes weak concrete, even though it is retempered by turning or adding water.

After depositing 1½ inches of concrete in the form, carefully spade it, and then place the reinforcing rods 1½ inches from the side forms. Continue filling the form, spading thoroughly, meanwhile, until within 1½ inches from the top, then place the last two reinforcing rods 1½ inches from either side form. Then fill form completely and neatly trowel or smooth the concrete.

Too much emphasis cannot be placed on the spading of concrete, because it is essential that the surface of the concrete be dense and free from voids. No air bubbles should be allowed to form. If considered desirable, convex moulding can be placed along the square corners of the mould, thus giving a rounded corner which will not fray the clothes line.

Everlasting concrete clothes post.

Grape-Vine Posts of Concrete

The grape trellis shown below was erected more than a year ago on a farm near Chalfonte, Pa. The posts were made of concrete consisting of one part Portland cement, one and a half parts sand, and three parts small stone. They are reinforced by placing in the corners of each post, about one inch from the sur-

square twisted rod. Three-eighths-inch round rods could be used in place of square rods [illegible] long, of which four feet is be[illegible] and six feet above the ground. They are six inches square at the lower end, tapering to four inches square at the top. Through each post five holes are provided to receive the wires upon which the vines are trained. At the end posts the wires are fastened to eyebolts, ⅜-inch in diameter, and about 12 inches long. These bolts extend through the end post and are threaded with a nut for tightening the wire. The

Yankee vise mounted on swivel base for use on bench. Quickly detachable for use on drill press, shaper, etc. It is manufactured by North Bros. Mfg. Co., American St. and Lehigh Ave., Philadelphia, Pa.

bolts and fastenings are clearly shown in the illustration.

In the construction of the Chalfonte trellis, the slanting brace for the end post was cast in place. A notch was left in the post and the form for the brace was set up. The reinforcement of the brace projected beyond the end of the form and into the notch, the end of the form merely fitting up against the post. At the ground end of the brace an excavation was made. When the concrete was placed this excavation was also filled, thus forming a bulb or enlarged end, which answered the purpose of an anchor. The brace form was then filled with concrete, which was worked into the notch, entirely surrounding the ends of the reinforcing rods, the latter being curved at the ends to firmly anchor them. It would be feasible, however, to precast the brace, merely providing for it a notch in the post. The notch could be easily formed by nailing a triangular block to the side of the form. The post end of the brace should be set in cement mortar.

Form for Casting Posts

The form for casting the posts is very simple. It consists of three boards, which form a trough the exact size of the finished post. The side boards are attached to the bottom piece by hinges so that they can be readily swung down when the post is removed from the mould. The wire holes are established by placing at the proper points short pieces of ½-inch gaspipe cut so as to fit between the side boards of the form. Through these short lengths of pipe, which are left in the concrete, are placed temporarily ⅜-inch bolts. These bolts, which also go through the side forms, serve to clamp the forms together while the pipe spaces them at the exact distance. This method of fastening is shown in the accompanying drawing. The mould should be oiled with a heavy lubricating oil before casting each post. This permits easy removal of the finished post. Under ordinary conditions the posts shown should be made at a cost of about 30 cents each. This price is as low, or lower, than the cost of an ordinary wooden post of good quality.

* *

Yankee Bench Vise With Swivel Base

The illustrations herewith show a Yankee bench vise mounted on swivel base, for use on a bench. The upper part is quickly detachable for use on drill press, shaper, etc., and putting back again on swivel base. This is a feature which should appeal to mechanics who have work to do on both bench and machine.

The vise alone may be used on either side or on end. The body and sliding jaw are of cast iron, with hardened steel faces. The sliding jaw extends through slot one inch wide in body of vise in one piece, fitted with two steel keys set in the same, thus securing a parallel movement, and so constructed as to cause very little wear.

The screw is of steel ⅝-inch diameter, with Acme thread. The head on end is 13-16-inch diameter to receive sliding bar, made of 5-16 diameter steel and is 4½ inches long.

The swivel base, on which the vise is mounted, is locked or released by a short movement of lever on one side. The base is 4½ inches in diameter, has three bosses on under side to give a level bearing on bench.

The upper part of swivel has a taper piece to receive taper end of sliding jaw with setscrew in one end to force tapers into position, thus clamping vise and base perfectly rigid.

The jaws of vise are 2¾ inches wide, 1⅞ inches deep, and open 3⅛ inches. The extreme height with

Concrete posts for grape vine trellis. These will never decay or get out of line.

swivel base is 5¾ inches, extreme length over all, 8¾ inches. The weight of vise and swivel base is 13 pounds 6 ounces.

The vise is manufactured by North Bros., n.e. cor. American St. and Lehigh Ave., Philadelphia, Pa.

* *

When the aggregate is composed of both broken stone and gravel, they should be mixed in such proportions as will give the least percentage of voids when mixed.

W. Walker & Son, Toronto, Greatly Enlarge Their Buildings

W. Walker & Son, 1225 Yonge St., Toronto, recently constructed the large new warehouse shown in the accompanying illustration, to carry their stock of builders' supplies. The original store is 16 x 70 ft., and the addition is 25 x 40 ft. This latter is a three-storey building with elevator and basement. It is of brick construction, cemented basement, steel girders covered with concrete, and reinforced windows, making a fireproof structure throughout.

The top flat of the new building is utilized as a tinsmith and galvanized iron department. The first and second floors are used for heavy shelf hardware, saws

New warehouse of W. Walker & Son, Toronto, wholesale hardware merchants, and specialists in Builders' Hardware.

all classes of builders' hardware, etc., while the basement is used for the storage of asbestos papers, varnish paint, white lead, and glass.

The ground floor is also used as a shipping room, there being an entrance to it beside the store. Underneath this is a storage room 70 x 70 ft., for the storage of sash weights, etc.

Complete Sample Room

On the top floor of the old building is a sample room 16 x 50 ft., in which are models of all locks, door checks, parlor door hangers, casement fasteners, grips, etc.

At the front of the building is a huge electric sign 13 ft. wide and 15 ft. high, T-shaped. On it are the words "W. Walker & Son, Hardware," and "House of well-made Hardware," the company's motto.

All oils are handled by a Bowser system of tanks and pumps. This system includes a gasoline storage tank and a delivery pump for street service.

A one-ton White truck is used for delivery within reasonable distance of the store and warehouse, while the travelers use Ford cars for calling on customers.

* *

Specifications for Cement Top Floors

The Aberthaw Construction Co., Boston, specifies as follows for cement top floors. This specification is for laying hard finish on new rough concrete, either paling or slabs supported by forms.

Finish to be mixed one part of cement to two parts crushed trap rock or hard gravel screening, which will pass through a ½-in. sieve, and from which the fine dust has been removed. This is to be thoroughly mixed in a mixing box or by machine mixer, with an amount of water to produce a plastic but not a sloppy consistency; spread on the under-concrete before either the finish or the under concrete has had time to set, floated with a wooden float to a true level and then lightly troweled with a steel trowel as soon as possible to bring it to the proper level and to smooth the top slightly. This will give a finish which is pebbly. It will not be dead smooth or slick like a sand finish.

After the finish has been troweled and has set sufficiently so that the covering will not mar the surface, it should be covered with sawdust, sand, cloths, or any other material which will hold water on it continuously. In building reinforced concrete work, difficulty will be caused by the sand and sawdust blowing about the work, filling the forms, and generally getting in the way. In working around a textile mill there is usually plenty of old bagging, and in a paper mill there are usually plenty of old felts which can be borrowed for the purpose of preventing this.

The finish should be kept soaking wet for at least a week, or better, for ten days. After two days it is possible to put up studs and do miscellaneous work on top of the new finish, provided it is not allowed to dry out.

* *

Interesting Roofing Information

The following tables showing the number of squares of roofing slate and the number of wood shingles required to cover a given surface, will prove of interest to all builders and contractors.

Roofing Slate.

Table of Sizes and Number of Slates in One Square (100 Square Feet) of Roof.

Size in Inches	No. of Slate in a Square	Size in Inches	No. of Slate in a Square	Size in Inches	No. of Slate in a Square	Size in Inches	No. of Slate in a Square
6x12	533	9x14	291	10x18	192	11x22	137
7x12	457	10x14	261	11x18	174	12x22	126
8x12	400	12x14	218	12x18	160	14x22	108
9x12	355	8x16	277	14x18	137	12x24	114
10x12	320	9x16	246	10x20	169	14x24	98
12x12	266	10x16	221	11x20	154	16x24	86
7x14	374	12x16	185	12x20	141	14x26	89
8x14	327	8x19	213	14x20	121	16x26	78

A square of slate is roughly estimated at from 600 to 700 pounds per square, varying according to the thickness of the different makes.

Weight Per Square Foot.

Thickness ..	⅛	¾	¼	⅜	½	⅝	¾	1
Weight	1.81	2.71	3.62	5.43	7.25	9.06	10.87	14.5 lbs.

Weight per cubic foot, 174 pounds.

On account of laps, it takes an average of about 2½ square feet of slate to make one of slating.

Pine Shingles.

Number and Weight of Pine Shingles to Cover One Square (100 Square Feet) of Roof.

Table based on 4-inch width. For other widths multiply given number by 4 and divide by the width.

Number of inches exposed to weather . .	4	4½	5	5½	6
Number of shingles per square of roof ...	900	800	720	655	600
Weight in lbs. of shingles on one sq. of roof	216	192	173	157	14

The number of shingles per square is for common gable roofs. For hip roofs add 5 per cent. to these fig-

Are Your Friends

Getting

The Canadian Builder and Carpenter

You can do them a good turn by introducing the paper to them, and at the same time make 50 cents on each subscription you secure for us.

Collect a dollar from each one who subscribes, and send name and address together with 50 cents, keeping the other 50 cents for your trouble.

The Commercial Press Limited

32 Colborne St. Toronto

Toronto Pressed Brick and Terra Cotta Co. of Milton, Limited

Works and Office MILTON, ONT.

Toronto Offices 152-4 Bay Street

Manufacturers of High Grade

Pressed Brick

In All Colors

Our manufacture has been used by principal Architects and Contractors for the past 25 years. And the quality of our bricks is backed up by one of the longest lists of satisfied customers held by any Brick Manufacturer. This is our recommendation of the grade of our Pressed Brick.

The following is a list of a few of the new buildings which we have supplied and are supplying:

New Y.M.C.A. Building, Brantford. New Y.M.C.A. Building, St. Thomas. New Y.M.C.A. Building, Guelph. New Husbandry Building, Ontario Agricultural College, Guelph. New Factory for The Buffalo Forge Co., Berlin. New Factory for The Consolidated Rubber Co. Berlin. New Factory The Guelph Lumber Co., Guelph. St. James' Lutheran Church, Elmira. New Factory for the Hinde & Dauch Paper Co., Toronto. The Massey-Harris Co., Limited, Toronto. The Robert Simpson Co., Limited, Toronto. The King Edward Hotel, Toronto. New Factory for The Galt Robe Co., Galt. New Post Office, Brantford. New Post Office, Bracebridge.

Practical Book *on* "Carpentry"

By Gilbert Townsend, S.B.

with Ross & McFarlane, Montreal

This is a working manual for carpenters and woodworkers in general, giving complete practical instruction in the selection of the various kinds of lumber, layout of the house, construction of frame doors, roof, windows, gables, etc., and an abundance of other practical information.

160 Pages : 224 Illustrations

We have sold more copies of this book than any other on carpentry or woodworking. To readers of The Canadian Carpenter and Builder it will be sent, post paid, on receipt of $1.00.

Technical Book Department

The Commercial Press, Limited 32 Colborne St., Toronto

ures. The weights per square are based on the number per square. Shingles come 250 to the bundle; 4-in. shingles weigh 240 pounds to 1,000.

Chatham Builders Guests of London Exchange

Nineteen members of the Chatham Builders' Exchange visited London July 13 and were entertained by the London Exchange. The visitors arrived in motor cars and were taken through much of the business and manufacturing sections and then through the northern residential section to Springbank, where they inspected the waterworks and the park.

At 6 o'clock they were taken in a special car over the new electrified road to Port Colborne, and were guests at a splendid dinner at the Invererie.

At the banquet in the evening the speakers were: Mayor Stevenson, President T. R. Wright, of the London exchange; Vice-President A. E. Nobbs, E. R. Dennis, Alderman Haney, J. A. Tancock, S. Manness, Trustee William Hayman, M. M. Maxwell, William Robertson, Ben Blonde, and L. H. Martyne. Messrs. Harry Stratfold and Charles Simpson gave songs, which were much appreciated.

President Tomlinson, of the Chatham Builders' Exchange, stated: "The members of the Chatham Builders' Exchange appreciate most sincerely the courtesy the London Exchange has shown in the trouble that has been taken to take us around the city. I am a firm believer in such interchanges and hope the London men will be able to return the visit at an early date. We have been much impressed with conditions here and by the reports, which showed that, in spite of the adverse conditions prevailing elsewhere, London has suffered no serious depression. I am pleased to see so many signs of progress and hope for further success for the local builders."

The members of the Chatham party were: President Albert Tomlinson, J. E. Oldershaw, Burrill Oldershaw, Chas. Guy, John Hildreth, William Palmer, William Robertson, Ben Blonde, Frank Blonde, J. J. Little, John Campbell, Harry Cade, William Boa, Ed. Prudhomme, R. McG. Coyle, George Wanless, M. M. Maxwell, Orville Harvey, and Thomas Rayhond.

Temperature Changes in Mass Concrete*

If free to move, all structural materials undergo changes in length due to changes in temperature, and, if not free to move, a stress in the material is produced equal to that required to produce the deformation in length. In order to determine the extent of this change in length, or the corresponding stress in the material, it becomes necessary to know the range in temperature to which the material is to be subjected. In large masses of masonry the changes in temperature at varying distances from the exposed faces are not known, and, largely due to this fact, the changes in length of large masses of masonry, together with the actual internal distribution of temperature stresses, are among the most indefinite factors in the design of such structures. The purpose of this paper is to place before the society the results thus far obtained of experiments being made to determine the changes of temperature in the concrete of the Arrowrock Dam, together with a description of the apparatus used. Although some of these experiments have been in progress for more than a year, the greater part of the results is still affected by the high temperature produced by chemical action while the cement is setting, and therefore this paper will be largely descriptive, and should be considered in the light of a preliminary paper. Among the conclusions already reached are the following:

(1) Large bodies of concrete deposited rapidly during a summer season develop a temperature of from 90 deg. to 95 deg. within a period of about thirty days, and maintain nearly that temperature for several months.

(2) In the case of concrete 1 ft. from an exposed face, there is a daily variation in temperature of about 2 deg., when the daily variation in the temperature of the air is about 50 deg.

(3) In the case of concrete 2 ft. from an exposed face, there is a daily variation of less than 1 deg. when the daily variation in the temperature of the air is about 50 deg.

(4) In the case of concrete 3.5 ft. from an exposed face, no daily variation in temperature is apparent when the daily variation in the temperature of the air is about 50 deg.

(5) The seasonal variation in the temperature of concrete 3.5 ft. from an exposed face is about 32 deg. when the seasonal variation in the mean daily temperature of the air is about 75 deg.

(6) The experiments have not yet been carried far enough to show the seasonal variation at other distances from exposed faces, but it is probable that they become very much less as the distance from the face increases.

*By Charles H. Paul, M.Am. Soc. C.E., and A. B. Mayhew, Assoc. M.Am. Soc. C.E.

Building Permits for the Month of June

Eastern Cities

	June, 1915	June, 1914	6 mos. 1915	6 mos. 1914
Maritimes—				
Halifax	$ 102,126	$ 60,617	$ 461,676	$ 475,000
St. John	27,200	50,050	169,050	294,250
Sydney	17,920	21,585	42,280	60,628
Quebec—				
Maisonneuve	8,000	176,600	39,600	1,327,550
Montreal	1,024,115	1,943,596	3,419,109	8,521,910
Westmount	286,000	212,680	454,700	479,500
Ontario—				
Berlin	52,805	122,960	156,320	488,475
Brantford	75,555	26,035	154,030	304,975
Galt	11,600	18,485	62,930	159,340
Kingston	39,470	16,797	118,494	176,072
London	200,110	187,165	607,575	1,128,715
Ottawa	152,350	535,575	821,750	2,362,225
Port Arthur	8,005	140,417	57,414	886,866
St. Catharines	60,552	135,155	182,998	532,011
Smiths Falls	.....	10,300	3,375	53,700
Toronto	806,838	2,935,054	3,184,197	13,476,140
Welland	10,124	46,686	90,997	248,578
Windsor	63,150	67,700	229,950	684,860
Peterborough	17,070	113,950	56,137	351,690
Woodstock	11,776	13,317	44,894	80,059
St. Thomas	23,635	32,735	74,795	256,761
Hamilton	107,800	372,100	799,423	2,214,200
Total 22 East. cities	$3,106,201	$7,239,559	$11,231,704	$34,563,505

Western Cities

Manitoba—				
Winnipeg	$ 450,150	$1,450,100	$1,090,300	$9,987,550
Alberta—				
Edmonton	66,450	740,750	197,525	3,562,847
Lethbridge	3,270	108,200	13,570	296,965
Medicine Hat	5,080	1,001,885	50,260	1,626,085
Macleod	9,000	.....	9,000	4,525
British Columbia—				
Vancouver	44,895	572,265	1,066,966	2,393,249
Oak Bay	2,750	21,650	19,400	206,825
New Westminster	8,710	25,170	35,025	149,065
Victoria	14,650	229,740	104,040	1,801,930
Vernon	1,115	5,520	4,985	28,000
Saskatchewan—				
Regina	12,150	175,150	60,755	1,355,120
Weyburn	1,080	61,200	13,420	283,450
Total 12 West. cities	$ 619,300	$ 4,391,630	$ 2,665,246	$21,695,615
Grand total, 34 cities	$3,725,501	$11,631,189	$13,896,950	$56,259,117

(Courtesy Financial Post.)

Art-Kraft
Metal Shingles and Tile

Roof your buildings with Art-Kraft Metal Shingles or Tile, and secure a roof that is fire-resistant, inexpensive, artistic, and which will resist the ravages of time and weather.

"Art-Kraft" Metal Tile will absolutely set your roof free from the expensive deterioration and objectionable limitations of wood shingles and actually cost less by comparison.

The first cost is the only cost—No repair bills.

Send For New Catalogue Just Issued

It will pay readers of The Canadian Builder and Carpenter to find out all about these Art-Kraft Metal Shingles; and to enable you to do this we have issued an attractive catalogue which we will send you free of charge. Send for it now while it is in your mind.

The Sarnia Metal Products Co.

Sarnia Ontario

Price List of Building Materials—Revised to Date

EDITOR'S NOTE—Great care is exercised in obtaining prices for this department. They are as accurate as it is possible for us to make them. We know, however, that because of varying conditions, different dealers' prices are bound to vary somewhat; and our purpose in publishing this department is to give readers an idea of prices, rather than absolutely definite information.

PRICE AT MONTREAL

Hemlock Lumber

2 x 4 in. to 2 x 12 in., 8 to 14 ft.	$24.00
2 x 4 in. to 2 x 12 in., 16 ft.	26.00
2 x 4 in. to 2 x 12 in., 18 ft.	28.00 to 30.00
1 in. hemlock No. 1	22.00
No. 1 hemlock decking	23.00 to 25.00
No. 2 hemlock dimensions and 1 in.	26.00 to 30.00

Pine

1 in. common and better pine 8 to 12 in. wide, rough	$32.00 to 40.00
2 in. white pine, mill stock	29.00 to 33.00
⅞ x 8 and 10 in. pine shelving	36.00 to 45.00
⅞ x 12 pine shelving	42.00 to 50.00
No. 1 white pine flooring	40.00
No. 1 spruce flooring	30.00
No. 1 pine decking, D2S	40.00
No. 1 pine V. or beaded sheeting	40.00
No. 2 pine V. or beaded sheeting	30.00

Pine Trim for Paint Finish

4 in. casing, per 100 ft.	$1.75
5 in. casing, per 100 ft.	2.10
8 in. pine base, per 100 ft.	3.25
10 in. pine base, per 100 ft.	4.20
4 in. pine window stool, per 100 ft.	2.75

Shingles, Lath Roofing, Etc.

No. 1 pine lath	5.00
No. 2 pine lath	4.50
No. 1 spruce lath	4.00

Cedar Posts—Fence

5 in. at small end	5c. foot
7 in. at small end	7c. foot

Hardware

Nails, wire, common	$2.30 base keg
Nails, cut, common	2.50 " "
Sash weights, cast iron	1.50 per 100 lbs.
Tarred felt paper	.43 roll
Building paper	.35 roll

Brick, Tile, Terra Cotta, Sewer Pipe

No. 1 dry pressed red bricks	17.00
No. 1 dry pressed buff bricks	21.00
Red stock bricks	11.50
Grey stock bricks	12.00
Wire cut brick for foundation work	10.00
Fire brick	25.00
Sewer pipe, 4 inch	10c. foot
Sewer pipe, 6 inch	15c. foot

Cement, Plaster, Stone, Etc.

Cement (bags extra)	1.90 bbl.
Sand, for cement or brick work	.95 ton
Lime	.38 per 100 lbs
Hydrated lime	10.00
Mortar color	5.00 bbl.
Plaster of paris	2.35
Crushed stone 2 in.	1.40
Crushed stone, 1 in.	1.60
Crushed stone, ⅝ in.	1.75
Hardwall plaster	$9.50 to 12.00 neat
	6.50 sanded ton
Gravel	1.35 yard
Hair (plaster)	.03 per lb.

PRICE AT TORONTO

Hemlock Lumber

2 x 4 in. to 2 x 12 in., 8 to 14 ft.	$21.00 to 29.00
2 x 4 in. to 2 x 12 in., 16 ft.	21.00 to 29.00
2 x 4 in. to 2 x 12 in., 18 ft.	24.00 to 30.00
1 in. hemlock No. 1	22.00 to 26.00
No. 1 hemlock decking	24.00 to 28.00
No. 2 hemlock dimensions and 1 in.	18.00 to 23.00

Pine

1 in. common and better pine 8 to 12 in. wide, rough	$25.00 to 33.00
2 in. white pine, mill stock	29.00 to 34.00
⅞ x 8 and 10 in. pine shelving	33.00 to 40.00
⅞ x 12 pine shelving	45.00 to 48.00
No. 1 white pine flooring	34.00 to 37.00
No. 1 spruce flooring	27.00 to 32.00
No. 1 pine decking, D2S	26.00 to 31.00
Spruce decking	27.00 to 32.00
No. 1 pine V. or beaded sheeting	35.00 to 39.00
No. 2 pine V. or beaded sheeting	30.00 to 33.00

No. 1 Common Yellow Pine

2 x 4 in. to 2 x 14 in., 10 to 16 ft.	$24.00 to 36.00
2 x 4 in. to 2 x 14 in., 18 to 20 ft.	29.00 to 38.00
2 x 4 in. to 2 x 14 in., 22 to 24 ft.	31.00 to 40.00

Yellow Pine Finish

4/4 x 6, 8, 10 and 12 B. & B. smoke finish	$41.00
5/4 x " " " "	45.00
6/4 x " " " "	45.00
8/4 x " " " "	45.00
4/4 x " " " steam finish	45.00 to 50.00
5/4 x " " " "	48.00 to 50.00
6/4 x " " " "	48.00 to 50.00
8/4 x " " " "	50.00 to 55.00

Pine Trim for Paint Finish

4 in. casing, per 100 ft.	$1.80 to 2.00
5 in. casing, per 100 ft.	2.00 to 2.50
8 in. pine base, per 100 ft.	2.75 to 3.25
10 in. pine base, per 100 ft.	4.00 to 4.50
4 in. pine window stool, per 100 ft.	3.00

Hardwood Trim, Flooring, Etc.

Quotations will be given on request.
See editor's note above.

Shingles, Lath Roofing Etc.

XXX B. C. cedar shingles	$3.35 per M
X. B. extras	4.00
No. 1 pine lath	5.00 to 6.00 per M
No. 2 pine lath	4.75 to 5.00
No. 1 spruce lath	4.25
Roofing	1 ply —$1.60 per sq.
	2 ply— 2.00 "
	3 ply— 2.40 "

Cedar Posts—Fence

5 in. at small end	.25 each
7 in. at small end	.50 each

Hardware

Nails, wire, common	$2.35 cwt.
Nails, cut, common	2.95
Sash weights, cast iron	2.00
Tarred paper	.60 roll
Building paper, plain	.50

NOTE TO READERS. We would be glad to have suggestions from readers as to the extension or modification of this list.

Ceresitized!

The foundation walls, elevator pit and chimney pit of the new Ford Motor Company's Toronto Building are everlastingly waterproofed with CERESIT *made positively waterlight and dry.*

"The Everlasting Waterproofing"

CERESIT

Choice of best informed Contractors and builders.

CERESIT Waterproofing Compound is used the world over with gratifying results. No matter what kind of concrete or cement work you desire waterproofed, CERESIT will measure up to your fullest expectations—*efficiently and economically.* Simple to apply - far-reaching in results.

We maintain at our our Chicago Office a complete staff of Waterproofing Engineers. Let these experts solve your problems.

Write for Literature

CERESIT WATERPROOFING CO.

982 Westminster Building **CHICAGO**

CANADIAN SALES AGENTS:

W. B. Poucher, Edmonton, Alta., E. G. Cullen, Vancouver, B.C., Walker's Ltd., Winnipeg, Man., The Whitlock Riddell Co., Moose Jaw, Sask., MacKenzie & Thayer, Ltd., Saskatoon, Sask., Brown & Chapman, Regina, Sask., W. K. MacDonald Co., Toronto, Ontario.

Hardwood Flooring *and* Hardwood Interior Finish

"WILSON BROS. LIMITED" on flooring means a carefully kiln-dried and well manufactured article. Our flooring is straightened, hollow-backed, bored, end-matched, steel polished and bundled.

We specialize in Veneered Doors to detail, also all kinds of Hardwood Interior Finish.

Write and send list and details for Quotations

Wilson Bros. Limited

Collingwood, Ontario

This illustrates our new warehouse, which enables us to give even better service to our customers.

W. Walker & Son

Specialists in

Builders' Hardware

It will pay builders and carpenters to get our prices for all kinds of builders' hardware.

We always have a large stock on hand, and will be glad to have readers of this paper come and see us when in Toronto.

W. Walker & Son, 1228 Yonge St., Toronto, Ont.

"The House of well-made Hardware"

Price List of Building Materials—*Continued.*

Price at Toronto—*Continued*

Glass

United inches	Star	D.D.
Up 25 (per 100-ft. box)	$6.50	8.00
26-40	7.00	10.00
41-50	7.40	11.70
51-60	8.00	12.00
61-70	8.75	12.75
71-80	9.50	13.85
81-85	10.50	17.50
86-90		18.85
91-95		19.20
96-100		22.75
101-105		32.00
106-110		36.00

Less 20 p.c. F.O.B. Toronto.

Wired glass ..... 18c. to 20c. per sq. ft.

Brick, Tile, Terra Cotta, Sewer Pipe

No. 1 dry pressed red bricks	$14.00 to 18.00 pr M
No. 1 dry pressed buff bricks	14.50 to 18.00
Red stock bricks	10.00 to 12.50
Sand lime brick	8.50
Grey stock bricks	10.50 to 12.50
Sewer brick	8.75 to 9.50
Wire cut brick for foundation work	8.00 to 9.00
Porous terra cotta bricks	12.00 to 15.00
No. 1 enamelled bricks, all colors, from	80.00 to 150.00
Fire brick	26.00 to 30.00
Sewer pipe, 4 inch	10c. foot
Sewer pipe, 6 inch	16c. foot
Verandah post caps, 16 in.	1.45 each
Verandah post caps, 20 in.	1.75 "
Chimney caps, 1 flue in 1 piece	2.00 "
Chimney caps, 2 flues in 2 pieces	3.50 "
Chimney caps, 3 flues in 3 pieces	5.00 "

Cement, Plaster, Stone, Etc.

Cement (bags extra)	$1.85 bbl. (1.55 in car lots)
Sand, for cement or brick work	1.20 a yard
Lime	.38 cwt.
Hydrated lime (Canadian)	10.60 ton
Hydrated lime (American)	11.60 "
Mortar color	black, 3; red, 2
Plaster of paris	$1.50 to 2.50
Crushed stone, 2 in.	1.20
Crushed stone, 1 in.	1.25
Crushed stone, ⅜ in.	1.25
Hardwall plaster	9.10
	5.00 sanded
Gravel	1.50
Hair (plaster)	.07 lb.

PRICE AT WINNIPEG

Hemlock Lumber

2 x 4 in. to 2 x 12 in., 8 to 14 ft.	$29.00
2 x 4 in. to 2 x 12 in., 16 ft.	29.00
2 x 4 in. to 2 x 12 in., 18 ft.	30.00

Shingles, Lath Roofing, Etc.

XXX B. C. cedar shingles	$4.00 & 3.50 per M
No. 1 pine lath	5.75 per M
Metal lath	.16 to .20
Roofing felt (2-ply)	2.50 per roll

Hardware

Nails, wire, common	$3.70 per keg
Nails, cut, common	3.70
Sash weights, cast iron	2.75 cwt.
Tarred felt paper	1.00 per roll
Building paper	.75
Insulating paper	1.25

Price at Winnipeg—*Continued*

Glass

United inches	Single	Double
Up 25	$6.00	8.00
26-40	6.50	9.00
41-50	7.00	10.25
51-60	7.50	11.00
61-70	8.00	11.75
71-80	8.50	12.75
81-85		15.75
86-90		16.75
91-95		17.75
96-100		21.00
101-105		23.50
106-110		27.00

Brick, Tile, Terra Cotta, Sewer Pipe

No. 1 dry pressed red bricks	$25.00 to 50.00
No. 1 dry pressed buff bricks	30.00 to 40.00
Red stock bricks	25.00
Sand lime brick	12.00
Porous terra cotta bricks	18.00 per M
No. 1 enamelled bricks, all colors, from	100.00
Fire brick	52.50
Oriental brick	35.00
Sewer pipe, 4 inch	.11 per ft.
Sewer pipe, 6 inch	.18½ per ft.

Cement, Plaster, Stone, Etc.

Cement (bags extra)	$2.60 per bbl.
Sand, for cement or brick work	1.85 a yard
Lime	.34 per bu.
Hydrated lime	12.00 per ton
Mortar color	.05 per lb.
Plaster of paris	.75 per bag
Crushed stone, 2 in.	2.65 per yard
Crushed stone, 1 in.	2.90
Crushed stone, ⅜ in.	2.90
Hardwall plaster	13.00 per ton
Gravel	1.85 per yard
Hair (plaster)	1.25 per bale

PRICE AT VANCOUVER

Shingles, Lath Roofing, Etc.

XXX B. C. cedar shingles	$2.20 & 2.10 per M
No. 1 pine lath	2.25 per M

Hardware

Nails, wire, common	$3.25 per keg
Nails, cut, common	4.25
Tarred felt paper	.90 per roll
Building paper	.70

Brick, Tile, Terra Cotta, Sewer Pipe

No. 1 dry pressed red bricks	$42.00 per M
No. 1 dry pressed buff bricks	42.00
Red stock bricks	13.00
Fire brick	45.00
Sewer pipe, 4 inch	.25 per ft.

Cement, Plaster, Stone, Etc.

Cement (bags extra)	$3.00 per bbl.
Lime	1.35 per bbl.
Hydrated lime	4.25 per bbl.
Plaster of paris	4.50 per bbl.
Hardwall plaster	14.50 per ton
Hair (plaster)	14.50 per ton

NOTE TO READERS. We would be glad to have suggestions from readers as to the extension or modification of this list.

Advertisements that Remind You

R. Laidlaw Lumber Co., Limited

Everything in Lumber

Timbers, Sash Doors, Columns, Etc.

Head Office: 65 Yonge St., TORONTO

Powell Lumber and Door Co., Ltd.

KORELOCK and KLIMAX Doors

In Oak, Birch and Fir

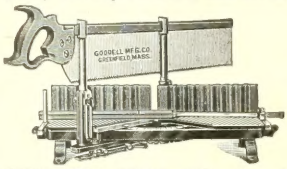
LARGE STOCK RIGHT PRICES PROMPT SHIPMENT

310-12 Front Street West, TORONTO

GOODELL MITRE BOX

Made of STEEL Cannot Break

For years this Box has been recognized as being first in quality and improvements, and the new STEEL BOTTOM PLATES with ANGULAR SERRATURES to prevent the work from slipping add still more to its convenience and attractiveness. Write for new *Circular D.* describing this and many other features.



GOODELL MFG. CO., Greenfield, Mass., U. S. A.

DENNISTEEL
LONDON - CANADA

THE BEST STEEL LOCKERS MADE IN CANADA

MADE BY

THE DENNIS WIRE AND IRON WORKS CO. LIMITED

LONDON, CANADA

WINDOW LETTERS

BRASS PLATES ENAMELLED IRON • SIGNS • WOOD & GLASS HOUSE NUMBERS

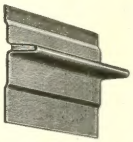
J.E.RICHARDSON & Co 147 CHURCH ST. TORONTO.

Are You Getting This Paper Regularly

If not, send your name and address, together with a one dollar bill, and we will deliver it to you each month, postage paid.

The Canadian Builder and Carpenter

32 Colborne St. Toronto



The "Peace" Patent

Improved

Metal Weather Strip

For Windows and Doors

To Carpenters and Builders this weather-strip constitutes a necessary part of the equipment in the building of factories, offices and residential property. It is wind and dust proof, and reduces fuel bills. Windows work easier with than without it. It does away with storm sash, and lasts a lifetime. Write for illustrated pamphlet or further information to

WILLIAM PEACE CO., LIMITED

Bank of Hamilton Building, Hamilton, Ont.

Phone 286 Live Agents Wanted

Professional Directory

Architects, Engineers, Patent Attorneys, Etc.

Patent Attorneys

will find that they can get a good deal of business from readers of this paper by persistent advertising.

TRADE MARKS, COPYRIGHTS & DESIGNS

PATENTS

STANLEY LIGHTFOOT

REG'D PATENT SOLICITOR AND ATTORNEY

LUMSDEN BLDG. (COR. ADELAIDE & YONGE) TORONTO.

NEW BOOKLET OF COMPLETE INFORMATION FREE

(MENTION THIS PAPER) M. 3713

Architects

will find that it pays to have a card such as this in this directory: costs only $20 per year.

INDEX TO ADVERTISERS

B

Batts, Limited ..... i.b.c.

C

Canadian H. W. Johns-Manville Co., Ltd. 5
Canadian Roofing Mfg. Co. 10
Ceresit Waterproofing Co. 31
Clare Bros., Ltd. 4
Consumers' Gas Co. 34
Crown Gypsum Company ..... o.b.c.

D

Dennis Wire & Iron Co., Ltd. 33
Disston, Henry, & Sons 7

E

Elliot Woodworker, Ltd 10

G

Georgian Bay Shook Mills, Ltd. ..... 3, i.f.c.
Goodell Mfg. Co. 33
Granite Concrete Block Co. 4

H

Hutchinson Woodworker Co. 4

L

Laidlaw, R., Lumber Co., Limited 33
Lightfoot, Stanley 35
London Concrete Machinery Co. 7

M

Martin Corrugated Paper Box Co. 8

N

North Bros. Co. 7

P

Page Wire Fence Co., Ltd. 6
Peace, Wm., Co., Ltd. 35
Powell Lumber & Door Co., Ltd. 33

R

Richardson, J. E., & Co. 33

S

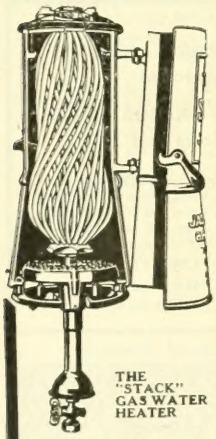
Sarnia Metal Products Co. 29
Schlueter, M. L., Co. 6

T

Toronto Plate Glass Co. 6
Toronto Pressed Brick Co. 27

W

Walker & Son, W. 31
Wilson Bros. 31



THE "STACK" GAS WATER HEATER

The Vital Importance of Hot Water

¶ Doctor and nurse alike realize the importance of hot water being always available; the occasions when it may be required and the purposes for which it may be necessary are innumerable.

¶ The recovery, or even the life of a patient, may depend upon the facilities for obtaining water quickly just at the requisite temperature.

¶ **The "Stack" Gas Water Heater** gives a supply of water at the right degree of heat, day or night.

¶ The "Stack" Heater is constructed on real scientific lines. It heats the water quicker than any other tank heater on the market. The price of the heater is $19.00. Connected and installed without extra charge. The "Stack" Heater can be fitted with distant control if desired—for particulars see any Licensed Plumber, or

The Consumers' Gas Company of Toronto

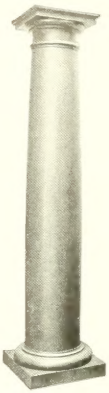
12-14 Adelaide Street West **Phone Adel. 2180**

WEST
BATTS LIMITED
TORONTO

BATTS' STAVED COLUMNS

BUY GOODS "MADE IN CANADA"

(WE MANUFACTURE ALL OUR OWN GOODS)



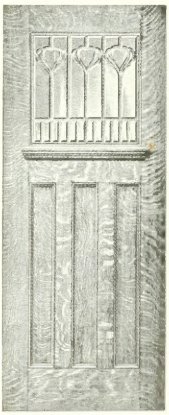
Design B. L. No. 1

Design B. L. No. 3

Design B. L. No. 4

Design B. L. No. 6

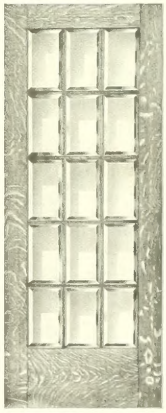
DETAIL WORK A SPECIALTY



B.L. No. 314, ¼-Cut Oak

B.L. No. 316, Chestnut

B.L. No. 334 ¼-Cut Oak



B.L No. 335 ¼-Cut Oak

We Specialize on Work from Architect's Plans and Details

385-387 Pacific Ave. **BATTS LIMITED** West Toronto

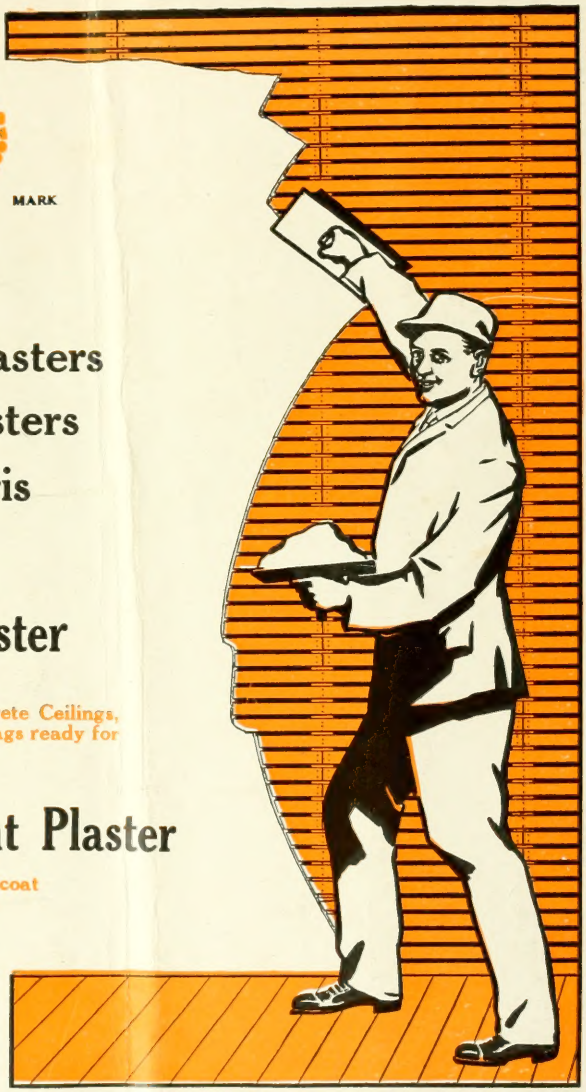
Crown Gypsum Co., Limited

MANUFACTURERS

HIGH GRADE GYPSUM PRODUCTS

TRADE MARK

CROWN



Hard Wall Plasters
Finishing Plasters
Plaster-Paris

Concrete Plaster

For plastering directly on Concrete Ceilings, Beams and Walls. In 100 lb. bags ready for use.

"BEAVER" Cement Plaster

A neat hair fibred base coat

Mines, Mills and Office located at Lythmore, Ontario, Canada

CROWN GYPSUM CO., Limited, Lythmore, Ont., Canada